

LEGO Smart Activities

Announcing the 2011 LEGO Smart Creativity Contest winners!

Congratulations to the 2011 LEGO Smart Creativity Contest winners!

The slate of winners was revealed at the STEM Summit in St. Louis in November. The nationwide contest was designed for educators to showcase their creativity by demonstrating in an original video how they use LEGO Education materials to spark student innovation.

The videos had to be less than 150 seconds and could feature classrooms using the materials, students telling a story, or a LEGO animation. Winners were selected in five segments: Lower Elementary (K-2), Upper Elementary (3-5), Middle School (6-8), High School (9-12), and Homeschool. In addition, one Grand Prize Winner was chosen from all submitted entries.

The Grand Prize Winner received a \$5,000 gift certificate for LEGO Education products and an all-expense-paid trip for two to the STEM Summit. All segment winners received a \$2,500 LEGO Education gift certificate and a trip to attend the summit in St. Louis.

To view the 2011 LEGO Smart Creativity Contest winners, [click here](#).

LEGO Smart Contest Winners Announced!

CONGRATULATIONS to each of our 2010 LEGO® Smart Creativity Contest winners and the 20,000 contestants who registered for this year's challenge!

This year's LEGO Smart Creativity Contest drew contestants from across the nation, representing all grade levels, and from all subject areas. The challenge? To create a classroom lesson about renewable energy that used LEGO elements to construct an object students would be studying.

We saw entries focusing on everything from solar power to generating energy from farm waste. The

number of creative classroom lessons filtering into our contest inbox was simply amazing. So, again, congratulations to all our participants and especially this year's contest winners!

Lower Elementary Category

Grand Prize Winner:

Solar Powered School by Renee Griffin, Pine Grove Elementary

First Place Winners:

Reduce and Reuse to Help the Environment by Nancy Rivera, Rivera Homeschool

Renewable Energy: Wind and Water by Tammie Koelle, Homeschool Educator

Upper Elementary Category

Grand Prize Winner:

Sunshine City by Karen Loutzenhiser, Homeschool Educator

First Place Winners:

LEGO Energy Blox by Janice Trees, Trees Family Homeschool
LEGO Star Windmill by Melissa Zammit, Sonshine Christian School

Middle School Category

In the coming months LEGO Education will add the winning activities to our web site, allowing educators from around the globe access to your classroom lesson plan.

Creating a LEGO Smart Windmill

LEGO Smart Activity

By LEGO Education

Wind power is a safe and inexpensive renewable energy source. Wind farms can be found around the world with more than 20% of some countries' energy produced by wind turbines! Within the United States, Texas leads the pack in energy produced by wind, generating enough power for up to 600,000 homes!

Within this activity, we will use the elements of the LEGO Smart Kit to create a movable LEGO Smart windmill. There are no right or wrong ways to construct the windmill; however, when it is complete, the blades must be able to turn. (**Hint:** The key lies within the smallest brick in the kit!)

After you have built your fully functional windmill, discuss the ways you might use wind energy in your classroom. What could you power with this renewable energy source? What other sources of renewable energy are there, and what could you build with LEGO bricks to represent

those sources of power?

Flags of the World

LEGO Smart Activity

By Daniel Carter, LEGO Education

The goal is to introduce students to the flags of the world. Flags represent many different people, places, and things. Exploring flags can be a fascinating journey into the history, mystique, origin, and lives of many cultures.

Using the bricks provided in a LEGO Smart Kit, ask students to build a structure based on the colors of various flags around the world. Each level of the structure must represent a color of a flag. For example, the American flag can be represented by a blue brick since blue is in the American flag, while a white brick can be used to represent the Canadian flag, and so forth. The structure with the most levels wins!

Flags can be from any country or represent any group, state, or organization. All levels must be the same height and fit within the confines of the previous level. The current record is nine levels!

Center of Mass Exploration

LEGO Smart Creativity Contest Entry

By Ian Durham, Saint Anselm College

In order to assist activity leaders in using this activity, a URL leading to a PDF that includes some basic pictures is listed at the end of the following description. 1. Students begin with the 8x2 brick and the single 1x1 brick. Initially they mount the 1x1 piece directly under the 8x2 in

8x2 brick and the single 1x1 brick. Initially they mount the 1x1 piece directly under the 8x2 in the dead center and set it on a table. It should stand on its own without leaning (barely). Note that this means the single 1x1 piece should be placed into one of the holes under the 8x2 piece.

2. Next, have the students mount a 6x2 piece crosswise on the end of the top of the 8x2 piece. The constructed piece should no longer balance. Students should now experiment with the 1x1 piece, moving it around among the seven holes pictured above until they find a location at which it balances when set on the table. Question for students: Did you have to move the smaller piece toward the 6x2 piece or away from it? Why do you think that is? Note to teacher: Assembled structure should balance with the 1x1 piece in the third hole from the right.

3. Students should then add a second 6x2 piece on top of the first. They will once again find that they need to move the small 1x1 piece in order for the whole thing to balance. Note to teacher: Assembled structure should balance with the 1x1 piece in the second hole from the right.

4. Next, students will need the following pieces: the 1x1 piece again, the thin 4x4 piece, two regular 4x2 pieces, and two regular 2x2 pieces. Students should mount one 4x2 piece and one 2x2 piece on top of the 4x4 slab such that they form an L. The second 4x2 piece should be mounted on top of the first with the second 2x2 piece being mounted on top of that in the corner (see diagram in PDF). Students can then place the 1x1 either in the holes under the slab or in the regular slots in attempting to balance the assembled structure. Note to teacher: Assembled structure should balance with the 1x1 piece in location shown on diagram in PDF.

5. Students should then experiment with a variety of sizes and shapes, each time attempting to balance some unevenly distributed load. The crazier the load, the harder it should be to balance, but it will push students to really understand the concept. It may not be possible to perfectly balance some bizarre shapes or students may find they can only balance it with a 2x1 or a 2x2. URL to PDF file of this activity:

<http://quantummoxie.wordpress.com/files/2009/10/legoentry.pdf>

Lesson Learned: *This activity explores the concept of 'center of mass.' It gives students a hands-on, discovery-based way to understand one of the most fundamental concepts in physics.*

Geography Challenge

LEGO Smart Creativity Contest Entry

By Melissa King, Home school

Using all the available LEGO bricks, students will build the shape of a state. Several different geographic challenges can be presented depending on the age level and ability of the student. For example: 1) Each student builds the shape of the state where they reside. (Early Elementary) 2) Each student builds the shape of a state they have visited or where a family member resides. (Upper Elementary) 3) Each student builds the shape of a state that borders the state where they reside. (Upper Elementary) 4) Each student builds the shape of a state that starts with a certain letter. The teacher could say, "Build a state that starts with the letter C." (Secondary levels) These challenges could be done individually or in teams.

Lesson Learned: *Students will learn how to recognize different states, especially the one they live in.*

Calculating Perimeter and Area and Extending This to Construction Technology

LEGO Smart Creativity Contest Entry

By Kay Kraatz, OCM BOCES - McEvoy Campus

Materials: LEGO Smart Kit (plates: 1-2x2, 1-2x3, 1-2x4, 1-2x6, 1-4x4; bricks: 1-1x1, 2-2x1, 3-

2x2, 1-1x4, 1-1x6, 1-2x3, 2-2x4, 2-2x6, 1-2x8; angle- 1-1x 4); Architect's triangular scale. This activity requires students to find smallest and largest area using: plates: 1-2x2 cream LEGO base plate, 1-2x3 red LEGO base plate, 1-2x4 red LEGO base plate, 1-2x6 black LEGO base plate, 1-4x4 green LEGO base plate. Students will determine the scaled area for the smallest and largest area using the architect's scale $1" = 4'$. Students will then calculate the amount of cubic yards of concrete to be ordered using the appropriate formula on the theory sheet, 4" thick slab. This activity requires students to find smallest and largest perimeter using: bricks: 1-1x1 LEGO pink brick, 2-2x1 LEGO green and yellow brick, 3-2x2 LEGO yellow and orange bricks, 1-1x4 LEGO green brick, 1-1x6 LEGO blue brick, 1-2x3 LEGO grey brick, 2-2x4 LEGO orange and yellow bricks, 2-2x6 LEGO green and grey bricks, 1-2x8 LEGO blue brick. Students will determine the scaled perimeter for the smallest and largest perimeter using the architect's scale $1" = 4'$. Students will then calculate the number of concrete blocks for one course using the appropriate formula on the theory sheet. Then students will calculate the number of courses and concrete blocks if the foundation wall is to be 8' high. During class activity: The teacher reviews the definition of area and perimeter (the students will use the definitions in the activity to determine which formulas are necessary for the calculations). The teacher will also review how the Architect's Scale is utilized to determine the scaled measurements. Area: First the students configure the plates measure the area covered by the plates. Upon completing the first task, the students then measure a different configuration of the plates and determine the new area. Next the students are to scale the area using $1"=4'$. Last the students calculate the amount of concrete to order for the scaled area of the concrete slab. The slab is to be 4" thick. The order is in cubic yards. Perimeter: First the students configure the bricks measure the perimeter of the bricks. Upon completing the first task, the students then measure a different configuration of the bricks and determine the new perimeter. Next the students are to scale the perimeter using $1"=4'$. Next the students calculate the number of concrete blocks to order for the first course of the foundation. Last the students calculate the total number of concrete blocks to order if the foundation is to be 8' high. The order is in number of blocks. $\text{Length(ft)} \times \text{Width(ft)} \times \text{Height(ft)} = \text{Total Cubic feet}$ $\text{Total Cubic Feet} \div 27 = \text{Total Cubic Yards}$ 1 Block = 16" x 8" The actual measurements are 15 5/8" x 7 5/8" to allow for 3/8" of mortar. Determine the amount of block needed for one course. Find the perimeter of the house. Multiply the perimeter by $\frac{3}{4}$. (Each block is 16".) Why? divide by size of block (16"or 16/12' or 4/3')dividing by 4/3 is the same as x $\frac{3}{4}$ The answer is the amount of blocks needed for one course of blocks around the perimeter. Determine how many courses are needed. Convert the height to inches (because the block height is in inches). 8 feet times 12 = 96 inches. Take the height in inches and divide by 8 (inches for the height in each row). 96 divided by 8 = 12. The answer is the number of courses of blocks. Therefore, we need 12 courses. Determine the total number of blocks. The number of blocks for one course times the number of courses is 12.

Lesson Learned: Students will learn how to design a concrete slab and a foundation wall given a limited amount of materials for a best fit.

Build 2 gether

LEGO Smart Creativity Contest Entry

By K Walker, Walker Christian Academy

1. Put students in teams of 2 or 3.
2. Give each an equal amount of bricks.
3. Give them the name of something to build.
4. Start with one student and each student gets to add 1 brick at a time trying to build the item you have named (like car or house).
5. Students cannot talk or help or tell the others where to place their brick.
6. Have each group share what they have managed to build.

A Day Without...

LEGO Smart Creativity Contest Entry

By LaJean Burnett, Webb Community Center

In this activity the class will be divided into teams of three to four students. Discuss the importance of diversity and what the world would be like if all of us were the same. Give each team a LEGO Smart Kit that will indicate that we will have to spend a full day without the inventions of African Americans. Each team will create a model of a day without some of these inventions or other contributions to society. Students will have to research to find some of these inventions. Construct a model using the LEGO Smart Kit based on your findings. Prepare a presentation that explains your model. Your presentation should include the following:

- Challenges that occurred while completing the activity
- Explanation of the components of their model
- A minimum of 5 inventions that were created by the specific diverse group
- What you gained from the experience
- Changes (if any) that will occur because of the experience

After the presentation the class will discuss whether or not the model was an adequate representation of what the group presented. What you gained from the experience

- Changes (if any) that will occur because of the experience

After the presentation the class will discuss whether or not the model was an adequate representation of what the group presented. Students will use inquiry-based learning, to design a model using, LEGO bricks. They will work in teams using knowledge gained from their research to construct a day without inventions that were created by various diversities (women, African Americans, Hispanics, Whites, and People with Disabilities). This activity can be used in a Humanities lesson on diversity; during specific holiday lessons, such as Black History Month or Hispanic Month; or during an English Composition unit that requires research. This hands-on activity that utilizes the methodology of modeling to engage the students allows them to address sometimes sensitive subject matters in a fun, yet thought-invoking manner.

Possible Solutions:

- Table - use the 2 x 2, the 1 x 4, and the 2 x 4 bricks to make a table (note this can couple as a stove range top)
- Traffic light - use a 1 x 6 for the base, a 2 x 8 for the post, a red 2 x 3, yellow 2 x 1, and green 2 x 1 for the colors of the traffic light (If you have 2 x 1's in each color this will be easier)
- Drop mailbox - 1 sloped piece for the drop box and a 2 x 6 for the post (note this can couple as a dust pan)
- Ironing board - 1 square brick for the base and a thin rectangular brick for the top
- Refrigerator - Use plates for the front of the refrigerator. More effective if you use different colors and put a handle on it with a 1 x 1 brick

Lesson Learned: 1. Use inquiry to design a model of a day without inventions by a specific ethnic group. 2. How to use reference materials and/or research topics using the internet 3. Gain a better understanding and respect for diversities 4. Communicate findings through methods that address various learning styles (tactile, visual, written, and oral)

Multiplication Masterpieces

LEGO Smart Creativity Contest Entry

By ALICE VAN FAROWE, COMPASS HOME SCHOOL

Multiplication is easy & fun with LEGO bricks as a tutor (especially for those dreading math class who would rather doodle)! Learn multiplication by doubling & tripling, then look at the more artful side of math. NOTE: The term "dots" will be used to describe the building surface circles on the bricks. Answers the students give are in parentheses). Start with Activity 1. Activity 2 is a follow up application. ACTIVITY 1: Multiplication Interactive DEMONSTRATION of 2's or doubling (or skip counting by 2's) WHAT YOU'LL USE FOR THE FULL DEMO: GREEN 4 DOT,

ORANGE 8 DOT, YELLOW 8 DOT, RED 8 DOT, BLUE 16 DOT, 2-YELLOW 4 DOT, WHITE 4 DOT, ORANGE 4 DOT. SAY: Find the green piece with 4 dots. We're going to double this green 4 with a different piece. Now find a red piece that is as long as that but twice as wide. The red piece shows that $2 \times 4 = 8$ & that $4 \times 2 = 8$. You reach 8 when you have 2 rows of 4 or 4 rows of 2. WRITE: $2 \times 4 = 8$ $4 \times 2 = 8$ SAY: There are 2 more pieces that show this math fact. What are they? (YELLOW 8 DOT & ORANGE 8 DOT) Line up the yellow & orange next to each other. Which piece would fit on top of them both connecting & covering them completely? (BLUE 16 DOT)

The blue piece shows that it is the same as 2 8-dot pieces. It is double the 8-dot piece. $8 \times 2 = 16$ & $2 \times 8 = 16$ You can build to 16 with 8 rows of 2 or 2 rows of 8. WRITE: $8 \times 2 = 16$ $2 \times 8 = 16$ SAY: You have 2 yellow squares, 1 orange square, and a flatter white one. Cover the top of the blue (Blue 16 dot currently in play) with them. Make sure all of the blue is covered. We haven't doubled anything; we've just covered up what we had. But we used different sized pieces. How many dots are on these new pieces? -4 The orange square has 4 dots; the white piece has 4 dots; and each of the yellow squares has 4 dots. How many sets of 4 do we have? -4 With 4 sets of 4, we have the same number we had before -16. We just counted to 16 differently. We can get to 18 by counting 8 rows of 2, 2 rows of 8, or by counting 4 sets of 4. $4 \times 4 = 16$ WRITE: $4 \times 4 = 16$ FOR ADVANCED STUDENTS: Try $16 \times 3 / 3 \times 16$, $6 \times 8 / 8 \times 6$. FOR EVERYONE: ART CONNECT: SAY: Architects are artists who use math all of the time in order to create designs for buildings. Using the pieces you have now, be an architect & create a building. Think outside the "block" & create something different. Can you create a courtyard? Does your building have more stories on one side than the other? Once you have your basic structure, use other pieces to embellish your design. ACTIVITY 2: Multiplication APPLICATION of 2's or doubling as well as tripling (or skip counting by 2's & 3's) WHAT YOU'LL USE FOR THE FULL ACTIVITY: BLUE 6 DOT, BLACK 12 DOT, GREEN 12 DOT, GRAY 12 DOT, AND ANY 3-4 DOT PIECES SAY: Find the blue piece with 6 dots. Now find the black piece that is as long as the blue one, but twice as wide or double the size. (More advanced students can be told once they have the blue piece to double it.) What is 6 doubled? -12 The black piece shows that when 6 is doubled, you get 12. How many rows of 6 do we need to reach 12? -2 How many rows of 2 do we need to reach 12? -6 We can get to 12 by counting 2 rows of 6 or 6 rows of 2. What math facts can we learn from this? ($2 \times 6 = 12$ & $6 \times 2 = 12$) WRITE: Have a student write the math facts $2 \times 6 = 12$ $6 \times 2 = 12$ SAY: There are 2 more pieces that show those facts - 2×6 & 6×2 . What are they? (green 12 & gray 12) Put the green 12 & gray 12 together stacked on top of one another. Now you've doubled 12. What is the double of 12? -24 Which math facts have you just built? ($2 \times 12 = 24$ & $12 \times 2 = 24$) WRITE: Have a student write the math facts $2 \times 12 = 24$ $12 \times 2 = 24$. SAY: Add your black 12 piece to the top. Now you've done something we haven't done before. You've just tripled the number. Doubling is twice or $2 \times$ the number. It is like counting by 2's. Tripling is like counting by 3's or giving $3 \times$ the number. Which math problems did you just create? (3×12 & 12×3) Three pieces of 12 dots or 3×12 . This is the same as 12×3 . If we add 12 more to our original 24, what do we get? -36 So 12 tripled is...? -36 And 12×3 or 3×12 equals...? -36 WRITE: Have a student write the math facts on the board. $12 \times 3 = 36$ $3 \times 12 = 36$ Have another student write the new terms & what they mean on the board: DOUBLE= $\times 2$ TRIPLE= $\times 3$ SAY: Use 3 pieces with 4 dots to cover the black 12 dot. What does this show? ($4 \times 3 = 12$ $3 \times 4 = 12$ 4 tripled =12) Now that you have doubled & tripled, what other math facts can you build? FOR ADVANCED STUDENTS: Try representing $12 \times 4 / 4 \times 12$ FOR EVERYONE: ART CONNECT: (TEACHER NOTE: You may want to get some pictures, postcards, or a calendar of cubist paintings to show the class.) SAY: Some modern artists do a style of art called cubism. Picasso made cubism famous. Instead of making pictures look real, artists using cubism let strong shapes - one of the first things you learned in math - represent real life things. They saw something or someone in shapes & put these shapes together to represent that person or thing. Think of a person or thing you can imagine as being made up of different squares & rectangles. Now try to represent your person or thing with a Lego Sculpture. If you are having a hard time

starting, draw a picture of it. Make it something simple-an apple instead of a bowl or fruit, a person's face instead of their entire body. Then fill in the picture with the squares & rectangles that you can fit inside of it. Using your drawing as a guide, build it. Legos' multiple colors can be used to make different parts stand out. You can also use Legos different thicknesses & sizes to also make one part stand out from another. Stack part of it higher than the other part to give it dimension. Have fun! If you don't like it, take it apart & try a different object.

Lesson Learned: *multiplication (or simplify to skip counting for younger kids), seeing math translated differently by arrangement (ie- 3×4 is the same as 6×2), measurement, using what is mathematical to do something artistic, inspire thinking of math-related artistic occupations or hobbies, can be used independently or with a partner to focus on teamwork, can be done in whole or part but best results & goals are met when used in whole even if over a few days*

Oh Buoy! It Floats!

LEGO Smart Creativity Contest Entry

By Suzanne Risser, Learning Center

Build a boat/barge 1. Use the plates to make a square bottom -- use the 2x8 on one side, the 2x6 on an adjoining side, the 2x3 AND the 2x2 on the next side adjoining the 2x6, then place the 2x4 in the middle next to the 2x6, last place the 4x4 in the remaining space 2. Use the 2x8 brick offset off the edge to join the side with the 2x3 and 2x2 plates 3. Use a 2x6 brick to join the 2x8, 4x4, and 2x2 plates along the outside edge 4. Use a 2x6 brick down the center to join the bottom plates in the center 5. Use remaining brick to build up side -- can add some individual style on this step Introduce density concept Activity: Density Why do objects that are the same size sometimes have different weights? The answer has to do with their density. An object's density is determined by comparing its mass to its volume. Use a flat piece of bread versus a balled up piece of bread to demonstrate. Now talk about displacement and buoyancy A ship (LEGO boat) will float as long as it weighs less than the water it pushes out of way, or displaces. Ships can use materials in their hulls that are heavier than water, but there must be air within the ship. Since the air doesn't weigh as much as the water, this lowers the weight of the ship compared to the same volume of water. Try this experiment to see how trapping air in

a ship can make it float. What happens if you fill up all of the empty space in the boat?

Lesson Learned: *Explore the concept of buoyancy*

LEGO Logic Rules

LEGO Smart Creativity Contest Entry (AUGUST WINNER!)

By Cynthia House, Thomas Middle School

Each student or team of two or more students receives the bag of LEGO bricks and the following information: Each of the six students in Mrs. Reyes' class selected three bricks from the bag. Can you figure out which specific bricks each student chose? 1. All six students selected bricks shaped like rectangular prisms. 2. No student chose a decorated brick. 3. If Colin combined the colors of two of his bricks he'd get the color of his third brick. 4. The number of hubs on one of Colin's bricks is twice the number of hubs on one of his other bricks. 5. Ashley and Brent selected bricks that are all the same color. 6. The sum of the number of hubs on two of Ashley's bricks equals half the number of hubs on her third brick. 7. All the students except for Colin chose bricks that are all the same thickness. 8. Ethan's bricks can be arranged to form a four by six hub rectangle. 9. Darcy and Ethan chose at least one brick with hubs arranged in a square pattern. 10. The colors of Francisco's bricks are related to the United States Civil War." answers: Ashley- 3 green bricks Brent- 3 yellow bricks Colin- pink brick white brick 2x4 red brick Darcy-

name, 3 green bricks, Brent 3 yellow bricks, Scott pink bricks, Mike bricks, 2x1 red brick plate, light green brick, black brick 2x3 red brick, all thin Ethan- light gray brick, two orange bricks all thick, Francisco- two blue bricks, dark gray brick

Lesson Learned: Students use logic to solve the puzzle. Clues come from geometry, algebra, art, and U.S. history.

Horse and Plow

LEGO Smart Creativity Contest Entry

By Suzanne Risser, Learning Center

1. Use seven LEGO bricks (including the 2x2 with the eye) to build the horse. 2. Use remaining bricks/plates to build various styles of plows/farm implements. 3. Discuss the history of farm machinery and its evolution 4. Discuss the concept of horsepower

Lesson Learned: this will help tactile learners by illustrating agricultural history by building a horse and plow. This lesson can also used as starting point to discuss "horsepower"

How Will It Stand?

LEGO Smart Creativity Contest Entry

By Ruth Anderson, Highland Elementary

The student will take his set of LEGO bricks and build a structure using the bricks with the largest amount of studs on bottom and end with the smallest amount of studs being the one on top. Can you reverse the process and put the smallest on the bottom and the one with the most studs on top? Will it stand? Why or Why not?

Lesson Learned: The student will problem solve using his knowledge of greatest to least.

Can You Build It?

LEGO Smart Creativity Contest Entry

By Ruth Anderson, Highland Elementary

Hand out a set of LEGO bricks to one student. Give an identical set to another student. Put a divider between the two students so they can't see each others bricks. One student will build a structure and describe to the other student what he has built by giving shapes, sizes and colors of the bricks. The student tries to build the same structure with only the directions given by the builder. When the student is finished, they compare the structures to see if they are alike.

Lesson Learned: The students will learn to problem solve without seeing the manipulative's needed for the activity. They will have to use their auditory skills and reasoning to solve the problem.

Cross the Colors

LEGO Smart Creativity Contest Entry

By Ruth Anderson, Highland Elementary

Stack or build a structure so that no 2 like colors are touching each other. There is more than one possible solution.

Lesson Learned: The students will learn to problem solve by using a specific amount of LEGO bricks and given a specific task to complete. This can be either a small group activity or in an

bricks and given a specific task to complete. This can be either a small group activity or in an individual setting.

Culture Fair Activity

LEGO Smart Creativity Contest Entry

By Joan Easterling, Mount Olive Elementary

This activity will coordinate with a school culture fair. In preparing for the activity, students will be divided into groups, select a country, and conduct research on this country. This will be completed prior to the introduction of this particular task. Culture Fair Activity: Design an animal, dwelling, or person associated with your designated country. Step 1: Students will work in groups using the information obtained from their search. Members of the group will choose a dwelling, person, or animal associated with their country and fashion it out of their LEGO Smart Kit. Step 2: Students will write a report describing the characteristics of the chosen artifact and how it is relative to their country. Both the LEGO model and the essay will be displayed at the culture fair.

Lesson Learned: *Students will learn to research for information, apply what they have learned, and work collaboratively to achieve a common goal.*

LEGO Flags

LEGO Smart Creativity Contest Entry

By Natalia and Matthew Dueholm, HOME SCHOOL

Make approximate flags (shape may differ from real flags) of different countries (with horizontal and vertical stripes). If you don't know many of them, use The World Encyclopedia of Flags or similar book. After designing as many flags as possible, students can discuss what pieces are mixing to make more exact models. What type of bricks do you need to make them perfect? Explore the flags with crosses. Make your own private flag. The teacher can introduce vexillology (the study of flags) and the principles of their design.

Lesson Learned: *Vexillology, Geography, Principles of Flag Design*

LEGO Code

LEGO Smart Creativity Contest Entry

By Natalia and Matthew Dueholm, HOME SCHOOL

Attribute a letter to each LEGO brick color following the model below: Yellow: A, Red: B, Blue: C, Orange: D, Green: E, Lime Green: F, Grey: G, Dark Grey: H, Black: I, Pink: K, White: K Try to make the longest possible word. You can use the same letter as many times as you have the bricks. (For example, if there are three bricks of a specific color, you could create a word using that letter up to 3 times.)

Lesson Learned: *Abstract Thinking, Vowel-Consonant distribution in English words, Spelling, Code Building*

Learning Together

LEGO Smart Creativity Contest Entry

By Anna Easterling, Mount Olive School

By Anna Fleming, St. Patrick's School

Students are assigned to small groups and given a selection of LEGO bricks. Their job is to work together to make a space ship, a building, a toy, a tool and something they choose. One topic is given each day. When the creations are complete, photos will be taken for an album record of results. The object is for the students to work cooperatively and to problem solve how to best use the Lego bricks to make the creations.

Lesson Learned: *Students learn to work cooperatively in small groups.*

LEGO Packer

LEGO Smart Creativity Contest Entry

By Natalia and Matthew Dueholm, HOME SCHOOL

What size/shape/type of container should you use to put all the pieces inside? The challenge is to fit the pieces in as small a container as possible. How would you estimate this? How would you put the pieces there?

Lesson Learned: *Economy of space/spatial reasoning*

Perception

LEGO Smart Creativity Contest Entry

By Michelle Kadow, Stockton Baptist School

Objects are broken up, analyzed, and re-assembled.

Lesson Learned: *abstracted form-instead of depicting objects from one viewpoint, the artist depicts the subject from a multitude of viewpoints to represent the subject in a greater context.*

Life In Europe During the Middle Ages

LEGO Smart Creativity Contest Entry

By Tanielle Kazmierczak, Power Ranch Elementary School

As a culminating activity to their Middle Ages unit, students will use the LEGO Smart Kit to create their own castle similar to ones they researched on the internet. Their castles must contain at least one tower and a stable for the royalty's horses. Students will place their castles on a piece of cardboard and draw the landscape to their castles. Students can design a coat of arms for their castles. They can also use two dowels and paper to create a scroll listing all of the rules for their castle.

Lesson Learned: *Students will practice working as a team to complete a project. They will use technology skills and hand-eye coordination to complete this project.*

The Very Hungry Caterpillar

LEGO Smart Creativity Contest Entry

By Moriah Slagell, One Day at A Time

1. I built a small caterpillar with just a few LEGO bricks to represent food 2. I added more bricks to the caterpillar and more food in front of him.(repeat 3 times) 3. Then, I took part of the caterpillar apart so I could build a cocoon then I slid the caterpillar inside. 4. Finally, I took apart the caterpillar and cocoon and made a butterfly out of the bricks.

Lesson Learned: *This quarter, I am learning about insect life. Using Eric Carle's book for inspiration, I did a series of designs to show the life cycle of the caterpillar's metamorphosis into a butterfly.*

Adjectives

LEGO Smart Creativity Contest Entry

By Mabel Martinez, Florida City Elementary/Miami Dade Public Schools

1. Distribute the same amount of LEGO bricks to each student (Lego Smart Kit). Make students aware that all pieces do not have to be used. 2. Have each student create an object. 3. Have student create a name for their object. 4. When students complete constructing their figure, have students write out a descriptive step by step paragraph in how they made their figure. 5. The students must name the size, color, and shape of the bricks and the amount of bricks that were used to create their figure. 6. Have students share and give constructive criticism on their piece of writing. Also have students show their piece of art!

Lesson Learned: *Students learned not only what an adjective is, but how to use it in their writing prompt.*

Serving Sizes

LEGO Smart Creativity Contest Entry

By Diane Babin

Students may work alone or with a partner for this activity. Provide students with a package of LEGO bricks. Their assignment is choose a favorite food then to build a model of the serving size recommended by the US Department of Agriculture (USDA) for that food. For example: The USDA recommends no more than 3 oz. of meat be eaten at a meal. 3 oz. of meat is approximately the size of a deck of cards. Students would choose the type of meat they want to represent then choose the LEGO bricks that, when put together, would equal the size of a deck of cards. Once the model has been completed students will create a simple sign explaining the food they chose, and the serving measurement for that food (3 oz., 1/2 cup, 1 tsp.). Students will display their LEGO models for the class to view. Actual serving sizes for the foods chosen or simulated models of food would further enhance the students' understanding of serving sizes.

Lesson Learned: *Students will view a visual representation of approximate serving sizes for various foods. These serving sizes are recommended by the USDA. They will also utilize their decision making skills and improve their spatial reasoning skills in selecting the LEGO bricks to use and designing a product that is the correct serving size. If they are working with a partner they will improve their communication skills as well.*

Rainbow Building

LEGO Smart Creativity Contest Entry

By Joann Franklin, home school/our lady of fatima

Put all LEGO bricks (bigger pieces) in a pile on the floor ..can do in teams or individual(maximum 4) each team/person is assigned a colorthen they pick out all the bricks of that color and create something...can do a show and tell describing their particular creation

Lesson Learned: *geared toward preschool and/or special needs children.....promotes color learning working with others creative thinking snacial skills verbal skills to name a few*

Look. Relay. Build.

LEGO Smart Creativity Contest Entry

By Wendy Klein

*Create a design using the LEGO bricks. *Break the students up into equal teams that consist of: looker, builder, parts, relay. *Put the design in a location that only the looker of the team can see. The looker can see the design, but cannot speak. He/she cannot come within a predetermined distance of the parts table (ex. 5 feet) *The relay person deciphers what the looker tries to explain through motions and pointing and takes that information to the parts person.(no writing notes) *The parts person is the only person allowed to touch the parts besides the builder. The relayer will describe what he/she thinks the looker is saying verbally and by pointing to parts. *The parts person picks up the necessary parts (size and quantity) and takes them to the builder. *The builder puts the pieces together per what the relayer describes from the motions of the looker. *After the time is up. Bring out the model for the students to judge who got the closest.

Lesson Learned: *communication*

Measuring Density

LEGO Smart Creativity Contest Entry

By Denise Thompson, Orting High School

Step 1: Have students construct a 4 X 6 table and label the columns "diagram, mass, volume, density". Step 2: Using a single LEGO brick, model for students how to measure the mass and calculate the volume of a cube. (This step may or may not be recorded as data) Step 3: Have students select a different sized brick and draw a diagram of the brick in the first box. Repeat step 2, recording their data in the appropriate boxes on the table. Step 4: Calculate the density by dividing the mass by the volume and record in the last column on the table. Step 5: Students should repeat steps 3 and 4 picking a different sized or shaped brick each time until they have tested 5 different bricks. More advanced students can combine bricks to add complexity. Step 6: Students should graph the mass on the Y axis and the volume on the X axis and then describe what patterns they see to the data. Have students draw a trend line and calculate its slope. If completed accurately, the points should form a "line" and the slope of the line should be roughly equivalent to the calculated density of a brick regardless of its color, shape or size.

Lesson Learned: *Students will practice calculating the volume of a cube, measuring the mass*

of an object and calculating its density. Students will practice graphing data, analyzing it for patterns and calculating the slope of a line. Students will understand that density is a property of the material an object is constructed of not the size or shape of an object.

2D to 3D to 2D Design

LEGO Smart Creativity Contest Entry

By Nancy Gonzalez, Hispanic Home schoolers

Pre-activity - Draw each of the bricks in the LEGO Smart Kit on construction paper (with correct perspective and color match). Cut out each construction paper block. Materials - For each 2 student team, provide a LEGO Smart Kit, as well as a complete set of construction paper cutout bricks. Activity 1- Ask one student to put together the 2D construction paper cutouts together to

bricks. Activity 1 - Ask one student to put together the 2D construction paper cutouts together to form a drawing of a shape to be built by the second student in the team. The second student will have 15 minutes to translate the cutout drawing into a 3D object using the bricks from the Smart Kit. Activity 2 - Ask one student to build a 3D object using the bricks from the Smart Kit. Give the second student the cutout drawings. The second student will have 15 minutes to translate the 3D object of bricks into a 2D drawing using the cutouts.

Lesson Learned: *translation of 2D designs to 3D and back to 2D design*

Build Our Community

LEGO Smart Creativity Contest Entry

By Mary Brodeur, 4 Seasons Academy

Place all LEGO bricks on a table and instruct students to each choose which building they would like to construct, ie..Firestation, police station, market, etc... All students must work together to build the hospital.

Lesson Learned: *They will learn to work together in order to achieve the same common goal.*

Treasure Hunt

LEGO Smart Creativity Contest Entry

By Shawn Garzony

Everyone loves treasure hunting. Using LEGO bricks to complete this activity, makes it even better. Make an "x" using 2 long bricks (red is preferred, but any color can be used.) Lego Smart kits may be used for this activity. The treasure "map" searching begins with a clue (such as: To locate the treasure solve this clue: Beside a -----, you will find 1+2). The next rhyming clue will be left next to or on the designated tree. You may wish to leave bricks at each place to collect along the way. (more clue examples: 2+2 will help you more when mom says "Please close the -----!", or A bag of 3+3 tricks has been left by the row of----- (bricks). All the clues do not need to use math facts. Place clues in sequence leading back to the classroom. The last clue will lead the students back into the classroom where they find the "x" and a lovely group of Legos to build with. Allow students as much time as possible to enjoy being creative with the bricks.

Lesson Learned: *This activity encourages team building skills, communication, adding and problem solving for elementary students.*

Multiplication Art

LEGO Smart Creativity Contest Entry

By Trish Dunlap, Home school

Each LEGO brick is worth 5 points. Students must independently build something of their own creation with their bricks with a value of 100. They must count the bricks themselves to figure out how many they need to use. If they use too few or too many, points will be taken off. They must also explain what their creation is.

Lesson Learned: *Problem solving skills, creativity, hand-eye coordination, math.*

Mosaics

LEGO Smart Creativity Contest Entry

By Julie Dees, Home school

Using grid paper, have students draw a simple picture with colored pencils. Next have them duplicate their picture on a base plate using the LEGO bricks of the same color as their picture.

Lesson Learned: *Students use LEGO bricks to express visual ideas and learn to think artistically.*

Mosaics 2

LEGO Smart Creativity Contest Entry

By Julie Dees, Home school

Using grid paper, have students draw a simple picture with colored pencils. Next have them duplicate their picture on a base plate using the LEGO bricks of the same color as their picture.

Lesson Learned: *Students use LEGO bricks to express visual ideas and learn to think artistically.*

Estimation Man

LEGO Smart Creativity Contest Entry

By Isabel Lee, Elysian Heights

The pair student line up the LEGO bricks vertically. They look at each brick and they try to estimate how long (inches or centimeters) each brick is and write it on math worksheet. Between each other they will explain the reason for the estimated measurement. Next, they get a ruler and measure each brick.

Lesson Learned: *The students will learn estimation, counting and communication.*

Listen Up!

LEGO Smart Creativity Contest Entry

By Isabel Lee, Elysian Heights

One student sits on one side of the table and the other student on the other side. There is a board between the two students. The first student gets the LEGO bricks, while the other student has copies of the bricks. The first student will build something vertically with the bricks. Then the student will give his partner directions (using position words) to build the same thing on their side. Then they check to see if the partner's bricks build the same thing. They reverse roles.

Lesson Learned: *They learn through this activity listening, follow directions and communication skills.*

Grid Me

LEGO Smart Creativity Contest Entry

By Isabel Lee, Elysian Heights

The students work in pairs. Then they get a grid paper. Next the students place the different LEGO bricks on various spots on the grid. Next, they trace the grid size of each brick. The

children take turns counting how many squares in a grid did each brick use. Then they finish writing the amount, they color in each grid that the LEGO brick took up. While this group coloring in another pair takes the LEGO bricks and they repeat the process. After each paired group finishes they present their results to the other students.

Lesson Learned: *The children will learn to measure each LEGO brick using a grid, hand-eye coordination and communication.*

Balanced Tower

LEGO Smart Creativity Contest Entry

By Stephen Tueller, JnS Education

Give each student (or team of students) a LEGO Smart Kit. Do activities 1-3 (5 and 6 are optional). Additional instructions for older students are given in parentheses (). [1] Using the pink 1x1x1 brick and the blue 2x8x1 brick, find the balance point. When the pink brick is connected under the blue brick, the balance point is found when the blue brick can stand on the pink brick without the 'tower' tipping over. Even when the balance point is found, some hand-eye coordination is needed to stand the tower on the pink brick. [2] Get two additional bricks of the same size. Place them at different locations on the blue brick. Notice that the tower will generally not balance if bricks of the same size are placed at different locations. (For older students, discuss location in terms of the arm length of a lever, and brick size in terms of weight.) [3] Remove the two additional bricks of the same size. Get two additional bricks of different sizes. Place the bricks at different locations on top of the blue brick. And find locations that lead to a tower that balances on the pink brick. (For older students, you can discuss how arm length can compensate for different weights. For geometry students, you can review the equations for arm length and weight.) [3.1] Sub-activity - see how many different combinations of the bricks in [3] lead to balanced tower. [4] Have students or teams of students attempt to attach all the remaining pieces to the blue brick in a weight that the tower balances. Notice which approaches use the bricks in the most uniform manner on each side (i.e., similar arm lengths and weights), and which approaches uses bricks the least uniform manner (i.e., compensating arm lengths and weights). You may also challenge students to take aesthetic presentation into account. [5] Challenge students to build balances with other combinations of bricks. For example, they might fit a flat brick vertically between the knobs of another brick, and build the balance tower with the knobs down which requires greater hand-eye coordination.

Lesson Learned: *This activity exposes students to the idea of physical balance using different combinations of arm lengths and weights. The activity requires hand-eye coordination, creativity, and can be done in individual or team settings. The activity can be used for students of various ages.*

Power Tower Bricks

LEGO Smart Creativity Contest Entry

By Grace Finn, Field-Stevenson School

Students will learn the first hand the "Power of Two" To begin with we will look at a chessboard and imagine that my salary will be 1 penny for the first week and 2 pennies the second week, then 4 pennies, and 8 and 16, etc. Ask students if they think if this would be a good idea? (Just about every student will tell me "No!") When I tell them that by the end of the 64 weeks (there are 64 squares on the chessboard) I will have more money than there is money in the world - they still cannot believe it. Taking the idea to a whole new level we will build a building in binary. Materials: Multiple sets of the LEGO Smart kit. Procedure: 1. Discuss the powers of two

and the chessboard example above. Review binary numbers 1, 2 4, 8, 16, 32, 64, 128, 356, etc. 2. Start with a group setting out a 1-stud brick and placing it on a 2-stud, placing them on a 4-stud and then on an 8-stud brick, and so on. 3. Students will need to work together carefully as their towering building as it continues to grow. 4. Continue adding levels (each level is 1 brick in height) until all bricks are gone. 5. Make observations: The area of the tower is expanding rapidly. Determine the power of 2 achieved using all bricks. Predict how soon (if there were enough bricks) the building would expand to fill the entire classroom floor, the school, the block and the town.

Lesson Learned: *Students will learn the first hand the "Power of Two"*

LEGO Classification

LEGO Smart Creativity Contest Entry

By Wendi Haines

Each group of students receives a LEGO Smart Kit (without the slanted "roof" piece). The group is to classify the bricks into groups according to characteristics. Each group decides what characteristics they will use, such as color, size, shape, etc. The group will explain to the class how they chose to classify their bricks. The teacher will then give the group the slanted "roof" brick and ask the group to decide what LEGO group the brick will be classified with. The group will use their classification system to determine where the brick will go; color, shape, size, etc.

The group will explain why they chose to put the brick with that classified group.

Lesson Learned: *Classification of objects (Science Benchmark - Know that living things have diverse forms, structures, functions, and habitats. (classifying plants/animals according to different characteristics)*

Balancing Act

LEGO Smart Creativity Contest Entry

By Susan Beam

Students choose the smallest LEGO brick as their base and place it on a flat surface (table). They proceed to stack the remaining bricks on top of the base. All bricks must be used. This activity can be done individually as a time challenge or as pairs racing each other to complete the balanced structure first.

Lesson Learned: *Students learn how shape, size and weight influence a structure's ability to remain erect as more pieces are added. They also learn that there is more than one solution to the activity.*

LEGO Guess

LEGO Smart Creativity Contest Entry

By K Walker, Walker Christian Academy

This activity is based on games like Pictionary or Charades. One student gets the name of an object to build and he does using the bricks in the kit. The other student get to try and guess what he is building. The builder cannot give clues. The child who guesses gets the next turn to build.

Lesson Learned: *Visual skills, team work, turn taking, sharing.*

Basic Spelling

LEGO Smart Creativity Contest Entry

By Suzanne Risser, Learning Center

To spell "leg" 1. Use one 2x8 brick and 2x6 brick to make an "L" 2. Use one 1x6 brick, two 2x4 bricks, and one one 1x4 brick to make the "E" 3. Use one 2x6 brick , one 2x6 plate, one 2x4

plate, one 2x3 plate, and one 1 x2 brick to make the "G"

Lesson Learned: *For K/1 basic spelling -- use the various bricks to build letters to spell simple words -- ie "leg".*

LEGO Floor Plan

LEGO Smart Creativity Contest Entry

By Natalia and Matthew Dueholm, HOME SCHOOL

Draw a map with pencil of your bedroom, drawing walls and marking the door and windows.

Add LEGO furniture to your bedroom using different bricks, for example, use a flat brick for carpet, higher bricks for beds and tables, etc. Try to keep real proportions. Children may then rearrange furniture.

Lesson Learned: *Interior Planning, Space Efficiency, Interior Design*

Is It Even or Odd?

LEGO Smart Creativity Contest Entry

By Ruth Anderson, Highland Elementary

Put all of the LEGO bricks on the desk. Separate the bricks in piles of even and odd according to the number of studs on the brick. Which has the most?

Lesson Learned: *The student will use his knowledge of odd and even numbers to separate the LEGO bricks.*

Solid Building

LEGO Smart Creativity Contest Entry

By Natalia and Matthew Dueholm, HOME SCHOOL

Make two solids out of at least two bricks (not necessarily of the same type): the second twice as big as the first. How do you know that one is twice as big as the other? How many different solids can you make? Name them.

Lesson Learned: *Proportions, Surface Area, Multiplication*

Learning Patterns

LEGO Smart Creativity Contest Entry

By Anna Fleming, St. Patrick's School

this will build the students' visual perception skills and strengthen beginning math skills.

Students will each be given a bag of mixed color LEGO bricks and be tasked with creating a pattern based on the model given. Each day for a week the students will have a different pattern task for their morning work.

Lesson Learned: *Children will learn simple patterns (AB, ABC, AAB, ABB, ABCD, etc)*

What Can You Invent?

LEGO Smart Creativity Contest Entry

By Mrs. Fonte's 1st grade class Fonte, St. John Greek Orthodox Day School

We first read books about famous child inventors. (The best was: Marvelous Mattie - How Margaret E. Knight Became an Inventor.) Next, we discussed how the people came up with their inventions. (Why did they need to invent something) Then, the students came up with their own inventions. Last, they presented their inventions to the class and explained what it was, why it is necessary, how it works, etc.

Lesson Learned: *thinking out of "the box", communicating ideas with others*

Will It Float?

LEGO Smart Creativity Contest Entry

By Terry ODaniel

Using all the LEGO bricks, create a structure of your choice that you think will float. Test your creation in a pan or sink filled with water? Did it float? If not, how could you change your creation so that it will float? What did you alter and how did it affect the buoyancy of your creation to help it to float?

Lesson Learned: *What causes a structure to float or sink? Learn concepts of buoyancy, density, how an object displaces water.*

How Does A Tree Grow?

LEGO Smart Creativity Contest Entry

By Daniel Slagell

The small pink brick represents the seed.. Next structure had the "tree" with only a few bricks added, the next added more bricks and so on until all bricks had been used.

Lesson Learned: *Using the bag of bricks sent, I did a series of "structures" to demonstrate the growth of a tree.*

Sorting

LEGO Smart Creativity Contest Entry

By Alyce Miller

1. Sort the LEGO bricks by color 2. Sort the bricks by size 3. sort the bricks by shape

Lesson Learned: *Kindergarten Math: They learn how to sort based on color, size, or shape*

Gestalt Laws Build

LEGO Smart Creativity Contest Entry

By Sandra Stauffer, Arizona State University

After reviewing class readings about Gestalt psychology, we listed various Gestalt psychology laws. We divided our class of 21 into four groups. Each group was given a tub of LEGO bricks (about 400 per tub). Each group had to use the bricks to illustrate as many of the Gestalt psychology laws as possible. We gave them about 10 minutes. They could build, arrange, place, etc. After the "build" time, each group had to visit the other constructions and identify the laws, which were confirmed by the builders. We then formed new groups, and repeated the laws, but this time asking them to eliminate color as the dominant element used to illustrate the Gestalt law. As before, after a 10-minute build, the groups rotated around to identify the laws illustrated by others. Great thinking and discussion.

Lesson Learned: *This "lesson" was an activity in a university music psychology class. Part of the semester includes a review of various theories. We used LEGO bricks to illustrate Gestalt psychology laws. Lessons Learned: ò applications of Gestalt psychology lawsò communication and work with others*

Seattle LEGO Needle

LEGO Smart Creativity Contest Entry

By Zechariah Roberson, Roberson Academy

The Seattle Space Needle collapsed! A museum wants a replica and they need someone to build one! Are you up for the challenge? 1. Get your 4x4 plate and your 1x1 brick from your LEGO Smart Kit. 2. Place your 1x1 brick under the 4x4 plate in the middle hole. 3. use all the bricks in your kit and build a creation that will balance on step 1's base. 3. use all the bricks in your kit and build a creation that will balance on step 1's base. 5. Take some pictures and send to the museum for entry (just joking!). Have fun.

Lesson Learned: *Learning to balance and engineering skills.*

If You Build It They Will Come

LEGO Smart Creativity Contest Entry

By Valorene Young, Ashley Elementary School

As a Post activity to conclude our study of shape and an intro into global home/community studies my students build LEGO structure of a rural, urban and surburban community. Students will be divided into three groups they will design their community. Keeping in mind that they will label the shapes they are creating as they draw their community. Students will then proceed to build their community guided by their design. They will also need people, vehicles, animals for the rural areas, sand for land areas and street signs. The last step in the completion of the project will be a oral presentation by the group describing their community and the shapes they created.

Lesson Learned: *A major part of first grade standard course of study is the study of shapes and how we can use different shapes to make structures.*

Draw Your Creation

LEGO Smart Creativity Contest Entry

By Debbie Fulkerson, Hodges Manor Elementary

The students will get in groups of 3-4, discuss what they will build (a forest, building, people, etc) then they have 2 class periods to build it. When they are done building it they will have 2 class periods to draw it and then color it.

Lesson Learned: *In teams of 3-4 children, they will have 2 classes to build their creation and then draw it*

Fair and Square

LEGO Smart Creativity Contest Entry

By Linda Kliewer, Home school

Object of the game: Form the perimeter of a square, then fill it in as much as possible in the allotted time. 1. Divide students into teams of two, and give each team a LEGO Smart Kit. 2. With each teammate sitting across from each other, take the two 1x2 bricks and put them about a foot apart, as if they were the ends of a straight horizontal line. Remove the remaining bricks from the bag and hold them above the invisible line. Drop them so they scatter on both sides of the line. The bricks on the side of the line closest to either of the team members will be the ones each teammate uses. If the amount is uneven, the player with more bricks selects a random brick to give to the other one. Each one gets one of the 1x2's. 3. Each team member has one minute to try to form a 2-dimensional solid square, using as many bricks as they can. The perimeter must be formed first, then attempt to fill in with the remaining bricks. 4. At the end of one minute, count the number of studs that are on the unused bricks (the black slanted brick counts as eight dots), then count the number of studs that you still need to complete a solid square. Add them together, then add your total to your teammate's total. The sum is your team's score. Whichever team has the lowest score is the winner. You may not help your teammate, nor place bricks on top of each other.

Lesson Learned: *Students will learn about defining a square, the difference between perimeter and area, and forming a square from other shapes. Students also learn to work as a team.*

Reconstruction by Memory

LEGO Smart Creativity Contest Entry

By Jenny Orlich, AtHisFeet Home school

This is fun for one or more students. Have identical sets of LEGO bricks- one for the model maker and one for each of the reconstructors. The model maker builds a creation using any number of LEGO bricks. The complexity will depend on the ability of the students and can be assessed in real time as you do the project several times. The students do not watch the creation being built. The builder shows the students the creation for some period of time, for example, 20 seconds. Then the creation is hidden and the students try to recreate it exactly, from memory. You can set up small walls between the students in order for them to do it

independently. Or, you may have them work as a team to build it. In that case, you may make a more complicated creation and have the students make a plan in advance on how they want to share the memorizing task (in the same way that two people might share memorizing a phone number - one person remembers the first three numbers and the other person remembers the last four).

Lesson Learned: *Students will practice attention to detail, intense short term memory skills, visual memory, and team memory planning during this LEGO activity.*

Apollo LEGO

LEGO Smart Creativity Contest Entry

By Margaret Augustinsky

1. Bring in an empty paper towel roll or grab a cardboard toilet paper roll from the school bathroom to use to test the end products for students. 2. Place students into groups of 3 (mix ability levels within groups). Provide one LEGO set per group of students. 3. Announce "Houston, we have a problem." Turn the lights off. Explain to students that they are within a spacecraft in outer space (for a younger audience, say that they are in the command center and have to get their astronauts down, as the students might not understand and become scared). Their air is being sucked out of a round hole (show tube). 4. They have 30 minutes (or any time the teacher designates) to build out of the LEGO sets a device that will stop the air from escaping. In addition to the bricks, they have anything on their bodies or that they can see within the classroom. 5. After students come up with their devices, test them on the tube, by either blowing through the tube or placing the device in front of a vent/fan. If no air goes through, the students solved the problem. 6. Provide support to groups as needed, taking pictures throughout the entire process to document learning. 7. Ask each group to talk about what they did and why. Groups that finish early can draw pictures of their devices or offer support to other teams. 8. Explain to the students that in real life, Apollo 13 crew members had to fit a square peg into a round hole in order to get back to earth. The crew used socks and duct tape, but if they had had LEGO bricks, I bet they would have solved more!

Lesson Learned: *Students learn practical problem solving skills, cooperation, and history.*

Visually Complementing History

LEGO Smart Creativity Contest Entry

By Julie Dees, Home school

The students will build a structure they learned about in their history class while the teacher summarizes or expounds on their history studies. Possible structures include: 1. Ancient Egypt - a Pyramid, the Sphinx 2. Ancient Babylon - a Ziggurat 3. Ancient Greece - a Temple 4. Ancient Rome - an Aqueduct, the Colosseum 5. Ancient China - the Great Wall 6. Ancient Americas - Mayan structures 7. Middle Ages - a Castle, a Cathedral 8. Westward Expansion - a fort, Native American Teepee 9. History of Flight - Wright Brothers Plane If some of the structures are more complex students could divide into groups and combine their kits. This would also teach team work principles.

Lesson Learned: *Visual learners usually find that information "clicks" when it is explained with the aid of a chart or picture. By using LEGO bricks to build a "picture" of what they are studying it will enhance their memory.*

LEGO Hunt

LEGO Smart Creativity Contest Entry

By Shawn Garzony

This game is designed with preschool through 3rd grade students in mind. It can be played with multiple grade levels together or individual levels. It is also fun for 4th-6th grade if used as a transition game between their already scheduled assignments. One LEGO Smart Kit per every 2-3 students. The teacher hides the individual LEGO bricks around the room while the children are not present. (a monitor may be chosen to stand with the children in the hallway while the pieces

not present (a student may be chosen to count that the children in the room; time and pieces are hidden OR the children may wait in a different room if this is done at home) The students are explained the rules: All objects can be seen without touching or moving anything in the room. Go over any safety rules that apply to the group such as "only walking", etc. Each time a brick is found, the student may pick it up and say "I love LEGO bricks" (or any other short fun phrase). When a student finds a second brick, that student needs to attach it to the first one (so they do not drop their collection and allow other students time to find pieces). The game continues until all the LEGO bricks have been found. When all the bricks are found, each student will use their imagination to construct an object or character. After the building is completed, each student will take a turn to announce to the class how many pieces they collected and what they have designed. For example, they may begin by saying "I found -- bricks and I designed ----". Older student version: Follow hide and seek procedures. Give the students extra time and paper and pencil to record the number of LEGO studs on each bricks they collected and add the total together. They will continue with the designing stage as well as orally telling the class how many pieces they had, the total number of studs and what they have designed.

Lesson Learned: *The students will use thinking skills, eye hand coordination, counting and communication skills.*

LEGO Sorting Center

LEGO Smart Creativity Contest Entry

By Alicia Hunter, Marlinton Local Schools

Students will use problem solving strategies to sort their LEGO bricks into groups of alike and different. 1. Students will receive a group of bricks when coming to the LEGO sorting center. 2. Students will be instructed to sort their group of bricks into two groups using all of their bricks. (For example they can sort the bricks by red and not red, four studs and not four studs etc.) 3. Students will explain to an adult how they sorted their group of bricks. 4. If time allows, students will be encouraged to find more ways to sort their same group of bricks.

Lesson Learned: *Students will learn how to classify LEGO bricks into groups that are alike and different and explain how their lego groups are alike and different. Students will use problem solving strategies to sort their legos into groups of alike and different.*

Classifying Creators with LEGO

LEGO Smart Creativity Contest Entry

By Harriette Mathews, Hall of Literary Glory

1. Using only the pieces in the LEGO Smart Kit, build an animal to represent 13 classes of the animal kingdom (vertebrates and invertebrates). 2. Take a photo of each and list animals by class, including common name and scientific name. 3. Explain why each represents its class. 4. Tell what you learned from this activity.

Lesson Learned: *basic taxonomy, scientific classification of animals, lateral thinking, research skills, time management, problem-solving skills, perseverance.*

Create a New Species of Bird

LEGO Smart Creativity Contest Entry

By Lydia Weiselberg, PS 118

After teaching a unit on birds have students work in pairs to create a new species of a bird. Give each pair of students a bag of LEGO bricks and instruct them that they have 15 minutes to create a new kind of bird. Tell them they should think about the different characteristics a bird has. Maybe their bird will have three wings or four legs, its up to their imagination and creativity to come up with their ideas.

Lesson Learned: *team building, hand-eye coordination, communication skills, and where can their imagination take them.*

Filler Up

LEGO Smart Creativity Contest Entry

By Angel Tudor, Whitehall Jr Sr High School

Materials: 66 LEGO bricks of equal size, *six containers of specified size, six shoe boxes, six graduated cylinders, one gallon of water, six metric rulers, and one digital balance * You will need to build six prisms of varying size prior to the students performing the lab. Build a prism using 4 bricks, then one using 6 bricks, then one using 8 bricks, then one using 12 bricks, then one using 16 bricks, and finally one using 20 bricks. Take the length, height and width measurement of each prism. Next, find six containers with corresponding measurements. Keep in mind that these containers will have to hold water. You can order prism containers from Nasco. You will also want to prepare the lab kits for the teams prior to the lesson. In each shoe box place the designated number of LEGO bricks and its corresponding container, a metric ruler, and a graduated cylinder.

Lesson: Start off the lesson by describing to students the various types of products container manufacturer companies produce. Pose the question, " How do these companies decide the dimensions for a new container?". Once students have completed their responses, explain to them that they will be performing an experiment to find out how the relationship between length, mass, and volume measurements might help container manufacturer companies decide the dimensions for a new container. Then illustrate the relationship between length, mass, and volume measurements. Be sure to give examples and work out math problems. Be sure to include that the volume of a rectangular prism is equal to length times width times height. Also be sure to review that 1 milliliter of water weighs 1 gram and that 1 cubic centimeter is equal to 1 milliliter. Next split up the class into six teams. Give each team a shoe box lab kit. Be sure to remind the students that they should be collecting data during this lab. They should draw pictures of their LEGO prisms and record measurements in centimeters. In the first part of the lab, have students build their rectangular prisms; measure it's height, length, and width; and calculate its volume. In the second part of the lab have the students use their graduated cylinder to fill the corresponding size container in their lab kit. Be sure to remind the students to record how many milliliters their container holds. In part three of the lab, have the students use a digital balance to find the mass of their dry, empty, corresponding size container in grams. Again remind students to record their measurements. Then have the students fill the container with water and find the filled containers mass in grams. Finally, have the students calculate the mass of the water by subtracting the weight of the empty container from the weight of the filled container. oughly dry their container once they are done. In part four have each team write up the results of their experiment. Their write up should contain the purpose of the lab, materials used, procedures, data collected, and a conclusion. Remind student that their conclusion should state the relationship between length, mass, and volume measurements and whether or not their lab findings proved if in fact the relationship exists or not.

Lesson Learned: *This activity will illustrate the relationship between length, mass, and volume measurements. Students will learn new mathematical knowledge and team building skills*

through a problem-solving lab. They will learn about the scientific method and apply it to proving the relationship between length, mass, and volume measurements. They will learn to apply and adapt a variety of appropriate problem solving strategies. To communicate their mathematical thinking coherently and clearly through written and oral presentation to their peers, teachers, and others. To apply appropriate techniques, tools, and formulas to determine measurement. Learn how to convert between units of length, mass, and volume in the metric system. Along with reinforcing their writing and keyboarding skills.

Build A Store

LEGO Smart Creativity Contest Entry

By Jessica LaVigna

First choose the pieces you want to include in your grocery store. These pieces may later be changed to congruent or similar pieces according to sizes differences and preference. However, they must all be included in some way. Second, measure the length of your store and find pieces that will let you build the walls of your store. You will not be adding a roof so as to be able to see the inside of the store from above. Third, add a door and windows wherever you want, but there must be access to the outside from inside of the store. Fourth, estimate to build at least 2 of the following items to include inside your store. They must all fit within the store, so make them as close to scale as possible. The items include: a cash register, a front office area, a deli, a floral department, and/or a meat department. You can also add a different department relative to a grocery store. Lastly, use special pieces to construct people shopping at your store.

Lesson Learned: *students will build a model store using LEGO bricks to measure, estimate, and compare congruent/ similar figures.*

LEGO Sort

LEGO Smart Creativity Contest Entry

By Rebecca Woodcock, Sullivan Middle School

Have students remove all the bricks from their LEGO Smart Kits. Explain that there are many different ways to sort items and ideas into categories. Have students come up with as many categories as they can using all of the separate bricks in their kits. For example, most students will easily sort by colors, sizes, etc. Encourage higher-level thinking by suggesting categories such as total area (bricks that are 1x6 have the same area as those that are 2x3). Then, challenge students to construct figures that can then be sorted into categories. For example, rectangular solids, similar shapes, etc. In all categorizing, have students keep written logs of all the different categories they generate. Finally, have students write a summary of the experience and how categorizing can be useful in other areas.

Lesson Learned: *Students will practice categorizing and written expression.*

Isometric LEGO Structures

LEGO Smart Creativity Contest Entry

By Rebecca Woodcock, Sullivan Middle School

After instructing students to examine the bricks in their LEGO Smart Kit, build a simple object on the light green base as an example. Then, using isometric paper on the smartboard, show students how this shape would transfer into an isometric drawing, making sure to display the top, front and side of the object. Then, have students build their own object on their light green

base and transfer it onto their own isometric paper. Once students have mastered a simple object, challenge them to build more complex structures to transfer. Next, display an isometric drawing on the smartboard (or distribute on paper to each student) and have students attempt to build the object shown. After several attempts at a variety of shapes, have students write a summary of the activity, addressing issues such as: Was it more difficult to draw the object or build the object? Was it difficult or easy for you to see the drawing as a 3-dimensional object? This is a good way for students to assess their own competency.

Lesson Learned: *Students will develop skills in the following areas: hand-eye coordination, transferring 3-dimensional objects to 2-dimensional drawings, transferring 2-dimensional drawings to 3-dimensional objects, and self-assessment.*

Attributes of 3D shapes

LEGO Smart Creativity Contest Entry

By Evelyn Lolis, Great Neck Public Schools

After whole class lesson identifying attributes of 3D shapes (focus on prisms and pyramids), students are then partnered and given LEGO bricks. Students construct a 3D shape and then describe its attributes on an index card. Team shapes are then to be used as center activities for other classmates to identify, as well as indicate shape attributes.

Lesson Learned: *Identify attributes of three dimensional shapes: Vertices, faces, edges, team building skills, modeling their learning*

LEGO Multiplication

LEGO Smart Creativity Contest Entry

By Holly Doe, Pelham Elementary School

1. Before beginning the lesson students will need a copy of a complete multiplication fact grid and colored pencils. Create one larger grid on posterboard that has the same amount of columns and rows (12x13) but leave it empty for placement of LEGO bricks later. For an example of a multiplication grid visit:

https://kmott.wikispaces.com/file/view/multiplication_table_complete.jpg 2. Discuss what an array is and how an array like the 4 x4 LEGO plate in the set has sixteen studs and can represent the multiplication fact of 4 times 4. Also mention that in "LEGO language" the plate is described as a 4 by 4 plate. 3. Pass out the LEGO Smart Kits to individuals or small groups of students and have them identify the arrays represented by the bricks in the kit. On their multiplication grids have them color in the corresponding fact with the color of the brick. Once students have completed this task, have the group combine their bricks to see how many arrays they can create when the bricks are placed side by side. 4. Using a larger set of bricks, assign groups a set of multiplication facts such as the 1 times facts or the 2 times. Once they have found all of the bricks to represent the arrays, have students bring their bricks up to the larger class grid and lay the bricks into their appropriate spots. 5. Debrief. Were the students able to find all of the combinations of arrays? Did they have to combine multiple bricks to come up with some of the solutions. How could understanding arrays help when we use bricks other times in class?

Lesson Learned: *Using LEGO bricks as a manipulative for multiplication, students will have a concrete understanding of multiplication and work on mastering their multiplication facts. Through the multiplication grids, students can also look for patterns.*

See Saw 2

LEGO Smart Creativity Contest Entry

By Laura Ringsmuth, home school

The student will count studs on LEGO bricks and add them together. The flat green 4x4 brick is your base. In the middle of the base place the orange 2x2 brick. Place the flat 2x6 black brick upside down on top of the orange brick so the ends stick out of each side like a see-saw. Proceed to balance as many of the other bricks as possible on either side of the see-saw. You place the bricks on the see-saw right side up so they don't click on to the flat black 2x6 brick that is upside down. You must only put one brick on each side of the see-saw at a time because none of the bricks that you pile up may click together. Once your towers topple over, count the total number of all the studs on the pieces that you have stacked up. The next player then tries to beat the score of the previous player. The player with the highest number of studs wins.

Lesson Learned: *The student will learn how to visualize the weights of different lego pieces and predict how one piece will balance against another piece.*

Counting By Eights

LEGO Smart Creativity Contest Entry

By Augustus Reid, Ashley Elementary

Students are given LEGO bricks. They are encouraged to discover the physical structure of the bricks. The teacher focuses on the brick's studs and counts them. With a calculator the student stacks blocks and records each group of eight is added to the figure.

Lesson Learned: *small motor skills, cognitive counting reinforcing the eight multiplication tables.*

Build and Explore

LEGO Smart Creativity Contest Entry

By Aimee Sonderman, home school

Each student has set a LEGO Smart Kit. Challenge is to build a vehicle (such as plane, boat, car, etc). Student should fly, drive, etc. his vehicle to someplace in the world and give 5 minute presentation about that place.

Lesson Learned: *world geography, history, modes of transportation, communication*

How Fast?

LEGO Smart Creativity Contest Entry

By Aimee Sonderman, home school

Pick a theme (dog, car, bird, flower, etc), Each student has a LEGO Smart Kit. Challenge to build that theme as fast as possible. Who can build the fastest? Whose looks most 'realistic'? Have each child describe their creation.

Lesson Learned: *Creative problem solving, hand-eye coordination*

Build and Pass

LEGO Smart Creativity Contest Entry

By Aimee Sonderman, home school

Place LEGO bricks in a non-see-through bag. Student A reaches in bag and picks out two bricks. Student A puts the bricks together and passes the bag and the 'creation' to Student B. Student B reaches in bag and pulls out a LEGO piece and adds it to the 'creation.' Players alternate turns until all bricks are used. To give the task more of a challenge, Have the players to build a specific category (animal, vehicle, etc.); Have players name & write about their creation.

Lesson Learned: *team building, communication, creative problem solving*

Leraning Locations Through LEGO

LEGO Smart Creativity Contest Entry

By Ruth Patrick, Williamstown Elementary

Our third grade class will make a list of all of the commercial and public buildings our small community has. With nineteen students, we will have nineteen building cards. We will also use nineteen residential cards that identify the different types of homes our students have: house, duplex, condo, and apartment. Students will use graph paper to draw a draft of 3 dimensional models of their homes and their businesses. Scale size will be important, so prior to beginning construction, students will discuss their plans to make building sizes consistent with one another. Then the buildings will be made using LEGO bricks. Students will work in groups to create a model of our town. Roads, parking lots and driveways will be added. Streets, homes, and businesses will be labeled. Our model town will become a teaching tool. 1) Students will learn how to give directions by using landmarks or street names. 2) Students will draw scale size buildings to assist with the creation of the LEGO buildings. 3) Students will work in groups to place the buildings, as well as other features to create our town. 4) The model community will be useful as a creative writing focus in language arts. Students will design advertisements for their businesses. They will write letters to each other using "addresses" from the model town. The student postmaster will collect and deliver these letters.

Lesson Learned: *By building a model of our community, students will link their own knowledge to their classmates' knowledge. Our class will be mastering social studies concepts while improving listening and speaking skills through language activities. They will benefit from coordination-building activities, especially those who are lagging behind. Students with poor coordination often avoid activities that require fine motor skills. Therefore, with the use of LEGO bricks and their knowledge of our town, they will assist in assembling the model community.*

Building Blocks of Education

LEGO Smart Creativity Contest Entry

By Crystal Michel, Believers are Achievers Home school

As a team create a multi-dimensional object using only the LEGO bricks provided. For example a cube or triangle would work.

Lesson Learned: *Team building skills, problem solving skills, hand-eye coordination, mathematical concepts, etc.*

Investigating Structures

LEGO Smart Creativity Contest Entry

By Belinda Henson, Christian Life Preparatory School

This activity would enhance Unit 8 in Christian Schools International Text Science Level 3. Lesson 1 introduces Scale Drawing and engineering. Students will begin preliminary design work on their structures. Lesson 2 introduces Strong and Stable materials and would include a discussion on the strength of LEGO bricks (does it have compressional strength, tensile strength, shearing strength) and what a LEGO structure could withstand. Lesson 4 details different types of bridges. Students would decide if building a bridge, what type of bridge scale they would build and what it would be used for. Lessons 5 and 6 is the actual building of the scale model and an evaluation of it.

Lesson Learned: *Student will learn about scale drawings and blueprinting in order to build a skyscraper, bridge, or dome.*

Design A Theme Park

LEGO Smart Creativity Contest Entry

By Melissa Goulet, McNicol Middle

Students will first have to research things that are found inside a theme park and create different teams that will be in charge to create different aspects of their area of their park. Each team will be composed of a project leader who will be responsible for the development of their assigned area. The students will then construct their area of the team which should be composed of a couple roller coaster, food services and others.

Lesson Learned: *Students will have to deal with solving problems, working skills, hand-eye coordination, mind creativity and learn to work in teams.*

How To Instructional Lesson

LEGO Smart Creativity Contest Entry

By Dennis Imoto, Hawaii Technology Academy

Using the LEGO Smart Kits, build a construction that will take you approximately 15 minutes to complete taking notes of each step that you do to complete the construction and writing it down or drawing it as you go. Have someone who's never seen you build this creation try to build it using your instructions, by reading or by following your diagrams, LEGO style. Once they start building you can't coach the other person and they must complete it within the time limit of 15 - 30 minutes.

Lesson Learned: *Writing or drawing skills, knowledge of LEGO pieces and writing instructions for others to follow in a step by step method.*

Simple Bridges

LEGO Smart Creativity Contest Entry

By Brenda Wanner

Build a bridge over a gap spaced 8 inches apart. After built begin placing weights on center to determine what design is capable of holding the most weight. discuss...

Lesson Learned: *Communication skills, cooperation, basic knowledge of architectural design.*

LEGO Smart

LEGO Smart Creativity Contest Entry

By Corinne Putnick, PAVCS

Pick a topic---animals,vehicles,colors, music, (math)--numbers,fractions,alphabet, words, the possibilities are endless. Instruct the child to build something in 1 minute, based on what topic is chosen. When time is up, discuss the creative work of art that the child has made. Take a photo for a creativity portfolio.

Lesson Learned: *Students learn to construct under the pressure of time, using hand-eye coordination, quick thinking, and individual creativity.*

Building Team Work with LEGO

LEGO Smart Creativity Contest Entry

By David Hren, King Career Center/Small Engines

Students follow the step by step guide provided by LEGO Technic guidebook for the snow machine, four wheeler and motorcycle. They work with partners. Their work is checked for proper suspension, steering, and propulsion along with doing the job in a timely manner. All of the students enjoyed this project.

Lesson Learned: *They learned: to identify parts and proper placement of parts, to follow written instructions and to keep inventory of parts. They developed skills in team building and communication as well. All of these skills will help them in their career with small engines and working with others. This project also helped them to learn the importance of focusing on the task at hand.*

Education Blocks

LEGO Smart Creativity Contest Entry

By Kathy Ray, Prairie Heights Middle School

The idea for this activity was sparked by student interest. I teach several sections of an all male 8th grade English class consisting of at risk students. To engage them in the learning process, I

asked them for ideas that would help them to succeed. They suggested being able to do some kind of project with LEGO bricks. Based on the students' ideas, several groups of students within the same class period will come up with a design plan for their LEGO project on paper. The next step of the plan would be for each group to present their plan to the rest of the class. They would need to create a colorful poster as a visual aid for their presentation. After all groups present, the class will vote on the LEGO plan they want to build as a class. According to student suggestions, the LEGO creation would be put together a few pieces at a time as students earn them for good behavior and/or grades.

Lesson Learned: *This activity will promote team building skills, group communication skills, public speaking skills, and problem solving skills.*

LEGO-ary

LEGO Smart Creativity Contest Entry

By Aisling Jones, home school

One student uses the bricks in the LEGO Smart Kit to build something that is in the room they

are in. The other students try to guess what the student has built. variations: Building something you would find in a particular room, using index cards ahead of time and having the student draw a card and build what is written on it. Whoever correctly guesses the item gets to be the next builder.

Lesson Learned: *Taking turns, communication, thinking skills*

Importance of Team Work and Communication

LEGO Smart Creativity Contest Entry

By Man Dev, New School

Team of 4 will be formed. Each member is given the title of construction worker and told not to talk to each other and form a design with LEGO bricks. Each team will be evaluated for team work & creativity.

Lesson Learned: *Importance of team work, communication, and leadership.*

Let's Sort

LEGO Smart Creativity Contest Entry

By Jun Han

Give each of the students a colored bag with a box of LEGO bricks. Ask students to pick out the bricks matching the bag's color

Lesson Learned: *learn about color and hand-eye coordination*

Well-Planned Houses

LEGO Smart Creativity Contest Entry

By Jane Hassan, Home School

Students will work in teams to build well-planned houses. This means they include all of the rooms they deem necessary for living, plus any extras they desire and agree on. There can be no more than 5 extra pieces when they are complete.

Lesson Learned: *Working as a team; brainstorming; planning skills*

LEGO Fun

LEGO Smart Creativity Contest Entry

By Jessica Case, Jim Ned High

Students work together to build something.

Lesson Learned: *Teamwork, communication with others, sharing*

Train Game

LEGO Smart Creativity Contest Entry

By Karen Goulondris, Hanna Perkins School

One player begins by selecting a LEGO brick to begin the "train" and places this brick on the table. The next player selects a second brick that has at least one similar attribute as the first

teacher. The next player chooses a second brick that has at least one common attribute as the first brick and sets this piece alongside the first brick. Possible attributes are size, color, shape, thickness or number of pegs on a piece. Players continue until all of the possible bricks are in line to make a "train". Challenge the students to use all of the bricks to make a "train".

Lesson Learned: *Students will learn team building and problem solving skills as they use one LEGO Smart Kit and work in groups of 5 or 6 to play the "Train Game". Students will investigate attributes of the different bricks including size, color, number, shape and thickness.*

Sorting/Classifying

LEGO Smart Creativity Contest Entry

By Amber Weaver, Jackson School

Working in pairs, students will sort the LEGO bricks into different categories. They will need to sort them into at least 3 different categories. Students will then notify me, and I will check their categories out. Once I've checked the group, they will then categorize their bricks into different categories from the first time. We will review the entire class's categories when finished.

Lesson Learned: *Students will learn how to sort/classify LEGO bricks into different categories. They will also learn team building skills such as communicating with their partner and taking turns.*

Homes

LEGO Smart Creativity Contest Entry

By Barbara Riordan, Jones Dairy Elementary

The students will work in a learning center with a partner to create their own special home. They will explain to the class about the home and its features.

Lesson Learned: *Children are learning about different kinds of homes we live in as part of an all about me unit.*

Engineering

LEGO Smart Creativity Contest Entry

By Nada Uber, Uber Academy

The students are expected to work together to build a structure that will be strong enough to hold a brick. It must span 6 inches, and be off the ground 4 inches. They will work in groups each week to accomplish the goal. Design and creativity count as bonuses!

Lesson Learned: *Building concepts/engineering. Cooperative learning, communication skills.*

City Build

LEGO Smart Creativity Contest Entry

By chandler Lee

Build a city as big as you can.

Lesson Learned: *just to have fun*

Spotting Spots

LEGO Smart Creativity Contest Entry

By Lora Newman, Newman Home school

Introduce the activity by discussing ways the students could compare the size of the bricks. For example, they could be arranged in piles from short to tall or from narrow to wide. Ask for suggestions. If the students do not come up with it on their own, suggest that one way of comparing the size of the bricks is by the number of spots (studs) they have. (If they do come up with that as a suggestion, run with it!) Depending on the level of the class, you may want to use the word area or you may want to just introduce it as another way of measuring the size. Instruct the students to sort the bricks into piles with different numbers of studs. Ask questions to guide the sorting. What is the smallest number of studs? What is the largest number of studs? Which number of studs is the most common? Do all the bricks with the same number of studs have the same shape? For more advanced classes, have the students choose a number of stud that has several different shaped bricks. Pass out round counters (coins, chips, paper circles). Ask the students to arrange the counters in the same pattern as they are on the bricks. Then ask them to find other arrangements for the same number of counters. Would these arrangements make good bricks to build with? Why or why not?

Lesson Learned: *This activity is designed as an informal introduction to the concept of area. The students will improve their visualization skills.*

Where's My LEGO Brick?

LEGO Smart Creativity Contest Entry

By Judy Spears, Bradley Elementary

Students use as many or as few LEGO bricks as they want for their "creation". Lower grade levels can do this during center time and place finished product in a baggie. Older students can complete this activity at their seat. After completion, students must observe and accurately describe their "creation". (Younger students may need a teachers help with the writing.) Lower grade levels will describe the colors, number of bricks used and the location of certain bricks (on top of, beside or under). Older grade levels will include area, perimeter, and mass in their descriptions. Then the objects can be placed on a table or other platform for display. Written descriptions are handed out and students should read the description and locate the correct object it is describing. This activity helps students with their observations skills, as well as writing and math.

Lesson Learned: *Lower elementary students learn colors, counting and location; older grades learn area, perimeter and mass. Each learns observation skills.*

Interlocking Structures

LEGO Smart Creativity Contest Entry

By Daniel Krueger, Home school

Students can work in teams or as individuals to make LEGO structures that "interlock" without snapping. I made a duck and pretended I had to catch him without hurting him. This meant I could surround him, but couldn't snap anything to him. Then I decided to make a submarine and pretend to rescue the submarine (with all its nuclear weapons...) with a device I built that would again not snap to it, but gently interlock with it. Once I built something that worked I tested it out. This time it needed to pull up and back without dropping the submarine. I tried

tested it out. This time it needed to pull up and back without dropping the submarine. I tried several different designs before I found one that worked nicely. After these you could develop a 3D interlocking system. You can try this out in a bowl of water. Can you get the two parts to fit together without touching one of them while it is floating in a bowl of water?

Lesson Learned: *How to interlock pieces without using the snapping. This can be done in 2D and 3D and for multiple pieces (2 or 3 or ??)*

Mouse Trap

LEGO Smart Creativity Contest Entry

By Cheryl Shoemaker, Shoemaker Home school

After discussing cause and effect with students, the class will brainstorm a list of everyday things that involve cause and effect. The teacher will then introduce the mouse trap assignment. When a mouse smells the cheese on a trap, he eats it which causes the trap to spring and as an effect the mouse is caught. With the LEGO Smart Kit provided, each team of two students will design a mouse trap system. The small 1 x 2 green brick will be the "mouse" and the yellow 1 x 2 brick will be the "cheese". The system may be designed to kill the mouse or trap the mouse. Use your imagination. The game "Mouse Trap" originally created in 1963 could be used in the classroom to jump start the children's imaginations and to show how one thing leads to another which ultimately traps the mouse.

Lesson Learned: *Students will learn how to work together as a team to create a system that uses cause and effect to trap a "mouse"*

Central American Ruins

LEGO Smart Creativity Contest Entry

By Melissa Prior, Queen of Apostles School

The students will learn about the three different groups. They will view pictures of their ruins. They will build and mimic the architecture used to make the temples.

Lesson Learned: *The students will be able to create and label the different ruins as Mayan, Incan, or Aztec.*

Don Quixote

LEGO Smart Creativity Contest Entry

By Dannielle North Decunto, Language Exchange of Northern Colorado, LLC

Our study of Spain includes the literature of Don Quixote. Begin by learning the stories and the ideals of the main character. Based on the sketch by Pablo Picasso we will then design and build Don Quixote on his horse next to a windmill. You can use LEGO Digital Designer in to help with design ideas.

Lesson Learned: *translation from idea to design to physical model using math, spatial design, team work, hand-eye coordination and persistence.*

Perimeter, Area, Volume

LEGO Smart Creativity Contest Entry

By Kavla George, Teague Intermediate

The student will lay the LEGO bricks side by side until they have a rectangle. They will count the studs on the edges of the bricks to determine the perimeter. Then they fill the rectangle in with more bricks. They will count all of the studs and explain how they got the area. Then they will connect the bricks to build volume and calculate how many studs are in the volume. They will record results in their journal.

Lesson Learned: *The students will be able to show what the difference between perimeter, area, and volume. They will be able to see why perimeter is 1 dimensional, area is 2 dimensional, and volume is 3 dimensional.*

Favorite Ancient History Structure

LEGO Smart Creativity Contest Entry

By Rebecca Bragg, Classical Christian Academy for young patriots

1. Discussion of objection and options 2. Decision and building plan. 3. Execution of steps. 4. Deal with problems that arise, troubleshoot to make structure secure, more realistic, etc.

Lesson Learned: *use of spacial perception and imaginative ability to recreate one of the studied ancient buildings. Additionally, will need to learn to work together, formulating a plan, and work through limitations.*

Parking Garage

LEGO Smart Creativity Contest Entry

By Kathleen Simonson, Colorado virtual academy

Use the LEGO Smart Kit to build a house or garage out of the bricks provided.

Lesson Learned: *hand eye coordination, creativity, cooperation, problem solving skills*

Scale Factor and Scale Drawings

LEGO Smart Creativity Contest Entry

By Chelly Alexis, Pomona Alternative School

Each team will be given a predetermined number of LEGO bricks and two randomly assigned scale factors. Teams will create a model and use the assigned scale factors to create two different scale drawings. All measurements will be recorded on a worksheet. When all of the scale drawings are completed, each set will be distributed to a different team. Working with scale drawings that were created by another team, each team will determine and record on a

worksheet the actual measurements of the models and will attempt to build the model. Pictures will be taken of the original and subsequent models. At the end of the activity, worksheets and pictures will be compared to determine accuracy.

Lesson Learned: *Students will learn how to use ratios to convert, read and construct scale drawings and models.*

LEGO Afternoons

LEGO Smart Creativity Contest Entry

By _____, _____

By Tim McDuff, Pawucket Public Library

Students are asked to build a creation based on a monthly theme while using literature and non-fiction reading materials as inspiration. Prior to building students are shown a number of books tied with that month's theme and allowed to browse the materials for ideas before actually begin to build with LEGO bricks. At the completion of the project participants will be encouraged to check out the books to continue to learn about the monthly theme.

Lesson Learned: *Designed to coordinate hands on building activity with literature and reading.*

Three Little Pigs and the Houses They Built

LEGO Smart Creativity Contest Entry

By Linda Nagy, Holy Name Elementary School

After reading and comparing several versions of "The Three Little Pigs" students are divided into small groups. Each group must draw a design on paper for a house that the three little pigs could build. Two groups will design and build a house of bricks, using LEGO bricks. Two groups will design and build a house of twigs, using real twigs previously collected outside. Two groups will design and build a house of straw, using real straw and mud. Each group will show & tell what they did to the rest of the class, including what didn't work and why it didn't. They will also explain why their finished product did work.

Lesson Learned: *spatial concepts, working as a team, creativity, retelling a classic fairy tale (comprehension, articulating in front of the class*

Creativity Hour

LEGO Smart Creativity Contest Entry

By Nathan Elznic, Home School

Give students a box full of materials and ask them to share, encourage, help, and make something not following a pattern or step by step instructions. They are given a topic like, animal, letters, airplanes, and will explain to others in a short speech what they made and any special features it might have.

Lesson Learned: *How to think outside the box, sharing with others, team work in ideas and creative input from others, etc*

ABCs in Bricks

LEGO Smart Creativity Contest Entry

By Sharon Black, New Life Christian Academy

Allow each student to pick a letter out of a hat. Give each student an assortment of LEGO bricks so they can form the letter with their bricks.

Lesson Learned: *Students learn teamwork skills, coordination and creating letter formation in a new medium.*

Making Shakespeare Come To Life

LEGO Smart Creativity Contest Entry

By Mark Witherington, Pulaski County School System

Working with students who have reading disabilities as well as behavior disabilities can be challenging. Classic literature is one of the most difficult subjects in which to engage students with disabilities. LEGO bricks provide a connection for these students to relate the reading materials to the mood or the tone of the author. This can stimulate their imagination and creativity. The students will read Romeo and Juliet by William Shakespeare. They will discuss the plot and strategy by using a plot diagram. After the introduction is presented in the story, these students will set up a scene using a green screen in the background. As a class, we will build the setting described in the introduction of the play by using LEGO bricks. We will locate appropriate images for the settings in the play to use as backgrounds for the greenscreen. We will discuss each character and assign a LEGO figure that best fits the each character described in the play. We will assign speaking roles to each student for each character. In each scene we will use LEGO animation. This will be accomplished by using a webcam, laptop, and the images chosen for the green screen. Each student will use their assigned LEGO figure and create leg

and arm movements for the stop motion. We will divide the acts into one of five categories: exposition, rising action, climax, falling action and resolution. After the acts are assigned to one of the five categories, students will shoot their stop action video according to their category. The scene for the green screen will change to reflect the scene for the acts. After the scenes have been shot, students will be assigned into five groups. Each group will be assigned to one of the five categories presented above. Using Microsoft's moviemaker, students will learn how to place each picture shot from the scene into a sequence and edit the scenes. After the completion of each category, we, as a class, will place each category in sequential order. We will edit accordingly. The next phase is the dialogue. Each student will read over the character script assigned to him or her. We will work on the tone, personality and setting of each of the characters' dialogue. We will go over the use of similes found in the play. We will discuss the internal and external conflicts of each character and try to portray these elements in the dialogue. Using a microphone and a computer for recording, the students will read the dialogue of their assigned character. We will place the recorded dialogue and animation together using Moviemaker. Once together we will add sound effects and the music. Each student will be able to relate to the motives and meaning of each character and this will enhance their experience and helped them remember the famous lines of the play.

Lesson Learned: *Students will improve comprehension of classical literature. Through the use of stop-motion technology, students will learn to work together in groups to develop a common goal. Students will engage in computer programs while learning how to direct, produce, and edit a movie. Students will learn how to understand certain elements of a story while engaging in hands-on activities. The end results will show how students can be effective communicators through small groups and their expression in media form-the finished movie.*

Count The Bricks

LEGO Smart Creativity Contest Entry

By Vicki Givens, Givens Academy

We will discuss looking at the bricks and guessing how many they think they see. How to count them out and put them into categories. The steps they need to build certain projects.

Lesson Learned: *Students learn counting skills as they build the project. Learn to guess and take averages of number of bricks needed.*

Retelling a Version of Goldie Locks & The Three

Bears

LEGO Smart Creativity Contest Entry

By Sally LaPorte, Dean Elementary School

Prior to activity, read a version of "Goldie Locks and the Three Bears" 1. Review the story of "Goldie Locks and the Three Bears." 2. Teacher asks: How would this story go if a Baby Bear wandered into the home of a human family while they are out for a walk? 3. Teacher tells students they will find a partner and create this version of the story. They will be given LEGO bricks to build four objects to use as props in telling the story; one object will be a bear, what might the other objects be? 4. Students find a partner. Teacher hands out LEGO bricks to students. 5. Teacher tells students they have a specific amount of time to work, as students are building their structures they should be creating the story. 6. Construction ends. Student pairs share their retelling with the class. Book resource, if available: "Deep in the Forest" by Brinton Turkle (1976)

Lesson Learned: *Students will work with a partner to create LEGO props to use in retelling "Goldie Locks and the Three Bears." Students will rethink the story to use a baby bear as the character who wanders into the house and finds the porridge, chairs, and beds. One prop students should create is a bear.*

Careers

LEGO Smart Creativity Contest Entry

By Mary Wertz, Douglas Elementary School

Students work in teams to complete LEGO people, buildings, vehicles that are required in each profession. They will follow step by step instructions to complete the activities. Lower elementary students will use illustrations to build structures, while upper grades will have written instructions. For example, if a student chooses to pursue a career as a fireman, they would construct firemen, fire trucks, hooks and ladders, kittens in trees, burning buildings, etc. They will journal through pictures and/or writing about what they might experience.

Lesson Learned: *Students will learn about careers, through LEGO based learning centers, which they could pursue as professionals, and the requirements and activities they will perform at these jobs. They will learn to problem solve and work as teams to complete as many creations for each career.*

Car Design

LEGO Smart Creativity Contest Entry

By Doug Myers, Home school

Design and build an auto from LEGO bricks.

Lesson Learned: *mechanical design*

Simple Machines

LEGO Smart Creativity Contest Entry

By Lawrence Lupoli, Perryville Middle School

Using wikipedia and www.simplerachines.com explain simple machines. Using a LEGO set

explain by showing levers, pulleys, wheels, incline plane, gears, etc. Now students discuss and decide which one they want to build. Then give them a challenge project. Like how do you get a bowl of jellybeans from a lower bowl to a higher bowl with the teams who use more simple machines in the project getting a higher score

Lesson Learned: 6 basic simple machines, how to work in teams

LEGO-A-Round

LEGO Smart Creativity Contest Entry

By Natalie Kroope, Northampton High School

Preparation: Students should place their desks in a circle, facing inward towards the center. Each student should be given an equal number of LEGO bricks. The number of LEGO bricks given to each student should be the number of students in the room plus three. Activity: 1. Each student will start by putting any three LEGO bricks together in any way they choose. Then, the teacher will instruct each student to pass their three-LEGO-brick-creation to their left. 2. The student who receives this three-LEGO-brick-creation will then add one LEGO brick of their choosing any way they choose. Then, the teacher will instruct each student again to pass this same creation to their left. 3. Students will continue this process until the original creation makes it around the circle to the original creator or until all students are out of LEGO bricks. 4. When completed, students will walk around the circle to admire and make comments about the creation they helped create.

Lesson Learned: Based on an activity called, "Write-a-round," LEGO-a-round allows student to

learn team building skills while using their creativity. This session will be used in our school district's newly created mandatory ninth-grade class called Peer Relations, specifically designed to build and enhance relationship between students and their school.

Create A Word

LEGO Smart Creativity Contest Entry

By Renee Thompson, Fernandina Beach Middle School

Each group will receive 25-30 LEGO bricks of various shapes and sizes. Step one, teacher models how to create a visual model of a chosen vocabulary word. Step two, all groups create a visual model of the same word with teacher direction. Step three, each group will make a visual model of a vocabulary word chosen at random. During this time, 1 student per group may get up one time during the activity to try to exchange bricks with one other group. This must be completed in 30 seconds. When complete, each group will teach their word to the class, including part of speech, definition, used in a sentence and justification of their LEGO representation. Students must also be able to describe their process during the entire activity.

Lesson Learned: Students will work together to create a visual representation of vocabulary words. Students will utilize their verbal, team building, and word skills through this activity.

Construct A Sentence

LEGO Smart Creativity Contest Entry

By Jennifer Hartley, Home school Educator & ECE Student

Before the lesson the teacher can tape, or write words on each brick. Flat base bricks are used as punctuation marks. Students work in groups of 4 to 5 students to create their own

sentences. Each group must build 10 sentences using their words and punctuation marks. They will write down their results and label words that are nouns, verbs, adverbs, etc. Group members help each other and learn together. This activity can be changed so that children can engineer spelling words, or learn reading skills. There are many possibilities.

Lesson Learned: *Learning the rules of Language Arts can take engineering skills as well. Students can learn how to properly construct a sentence by manipulating LEGO bricks. This activity has endless possibilities.*

Robot Cannon

LEGO Smart Creativity Contest Entry

By Elizabeth Garrison

To build a Robot Cannon, take the longer orange and yellow bricks and use them for a base. For the body, add the small yellow and orange bricks to the base, one on each side. Then add longer blue brick with shorter blue brick centered parallel on top. Then add green brick to bottom of longer blue so it is in between the base. Then add red brick protruding longways out of the back of the center of the shorter blue brick. Assemble the cannon snout: Put black brick on top of gray brick (protruding slightly). Add white brick to gray brick (area that is protruding slightly). Put yellow eye brick on top of white. Connect cannon snout by adding half of white brick over center of long blue body facing the front of the body.

Lesson Learned: *A child said, "It's harder to build things out of LEGO bricks than it looks." Hand-eye coordination was the lesson here.*

Architectural Challenge

LEGO Smart Creativity Contest Entry

By Jennifer Cave, Holly Ridge Middle School

Upon completion of the primary classroom activity and after choosing the LEGO Architecture Challenge as their "Plus-it" activity, students will begin the task of trying to recreate the assigned historically relevant building. Day after day, students will add to and rebuild the structure until the students working on the project (several over many class periods) reach a consensus as evidenced in the "Build Log" that the work is done. The students participating will receive "Plus-it" points in their final grade for the class.

Lesson Learned: *Students will work as both independent builders as well as in teams using LEGO bricks to recreate a significant building from the history of architecture. The project will help with visual spatial skills, team building, interpersonal communication and the development of leadership skills while reinforcing the trait of perseverance until the task is complete.*

Build a 3-D Object

LEGO Smart Creativity Contest Entry

By Meg Sundberg, Weymouth Township Elementary School

As a group, students will build a 3-D object. They must use all the LEGO bricks in their LEGO Smart Kit. They must name their object and measure for area. Then see if there is another 3-D shape that they can build. Compare and contrast the two objects.

Lesson Learned: *Students will be able to work as a team and cooperate to build a 3-D object*

Lesson Learned: Students will be able to work as a team and cooperate to build a 3-D object using all the LEGO bricks.

Surfacing with LEGO Bricks

LEGO Smart Creativity Contest Entry

By Kathleen Schuessler, Wyoming central school

Students will be introduced to surface area prior to the hands on activity. Once we get to this activity, students will be asked to create a character from the given LEGO bricks. When they have their character the way they want it, they will then be asked to find the surface area of their character. With this they will set up formulas, and list all necessary data, then using a calculator they will show the calculations and reveal their answers and their final surface area.

Lesson Learned: Students will create a character from the LEGO bricks given. Once the character is built then students will find the surface area of their character. The students will work in groups of 2. Once they are done another group will visit their character to find the surface area and see if they are correct.

LEGO Animators Unite

LEGO Smart Creativity Contest Entry

By Isabel M. Lee, Elysian Heights Elementary

First the students are grouped into four. Next the students will read various nonfiction (in this case animals) stories. Then they will determine which short nonfiction story they would like to retell by building their LEGO characters. Next they will use a Storyboard to map out the contents and direction of the project. Using the storyboard to show what will happen on each page of the story. After the students are done with the storyboard, it's followed with discussions within the group and the other groups for any suggestions they may have to improve their story. Then they will work with the teacher for her suggestions. Next each group decides what background(s) they would draw for their LEGO characters. They use the digital cameras to take pictures of their characters using stop motions in retelling their short story. Using a software called "Frames 4" they will develop their LEGO animal animation short story. Here the children will add title and text if needed. Also add voice over and music to their animation movie. The teacher and the students use the Animation and Technology Rubrics to score their project and the other groups projects. They save their project on Quick Time as a movie. They also make a hardcopy of their project as a keepsake. At the End of the Year's "Open House" they will present their "LEGO Animal Animation" to their peers and to their parents.

Lesson Learned: The lessons the students learned from this project are eye-hand coordination, team-building skills, communicate with others in vocabulary appropriate to technology and apply functional operations of technology components. This project teaches them self-confidence as writers, improve their reading fluency and read in a manner approximating natural speech. Students use digital cameras, Legos characters and develop their own Legos animal animation short story based on one nonfiction story.

Communicate with LEGO

LEGO Smart Creativity Contest Entry

By Lorie Marchant, Nikolaus Homestead Elementary

This Lego Smart activity has been designed as a Smartboard lesson, but could be used without

the technology components. Materials: A Lego Smart Kit or a collection of any kind of LEGO bricks, as long as it includes red, yellow and blue bricks. This lesson is easy to differentiate for different age and ability levels. The adult controls what bricks are set out to use, what numbers are inserted into the directions; then the students can take it as far as they want! AZ State Kindergarten Standards addressed: Math- S3C1PO1 Recognize, describe, extend, create, and record simple repeating patterns. S5C2PO 5. Explain and clarify mathematical thinking. Writing 3C3PO1 Participate in writing a variety of functional text (e.g., classroom rules, letters, experiments, recipes, notes/messages, labels, directions, posters, graphs/tables). Be sure to give the students ample opportunities to "free explore" with LEGO bricks before using the bricks for directed lessons. Activity 1 (Page 1 of Smartboard lesson:) Create a pattern using the number of bricks written by each color of LEGO brick. (Teacher either shows a picture of a red, blue and yellow brick with space to write a number by each, or uses real bricks to demonstrate with. Student answers can vary greatly such as; 1 blue, 2 red: blue, red,red,blue,red,red... or red,blue,red,red,blue,red,red,red,blue... Activity 2:(page 2 of Smartboard lesson) Directions: Put up a file folder partition between you and a partner. Make a design using the number of bricks your teacher designates. Take turns describing your design (verbally or in writing.) Your partner tries to build it without looking at it. Then reveal your design to see if you gave clear directions and if your partner followed them correctly. Let your partner do the building and try again! Activity 3 (Page 3 of Smartboard lesson): Directions: Create any kind of LEGO design that you'd like. Tell a partner about it (verbally or in writing.) Give your design a name. (Older kids could write a description or pretend story about their design.)

Lesson Learned: *Students explore building with Legos on their own or with a group. They build patterns, structures and designs with partners and then communicate their design through written or verbal description, mathematical pattern labeling (AB, etc.)and by naming their design. Younger children can communicate verbally and with pictures, older ones can write more detailed descriptions.*

Blind Building

LEGO Smart Creativity Contest Entry

By Tracy Segall, Home school

Working in pairs give each group a selection of 15-20 different shaped bricks. Have Student A close their eyes, or use a blindfold if temptation gets to them. Meanwhile, Student B will use 6-10 bricks to create a structure. When Student B is done he/she places the structure in Student A's hands and give them a set amount of time to feel the structure. At the end of the allotted time he gives back the structure for Student B to break apart and randomly place the pieces with others on the table. Student A then opens his/her eyes and tries to recreate the structure from memory of touch. Color of the bricks does not matter as some may be the same shape but different color. You can change the difficulty by using more or less bricks in a structure, and limiting the amount of time a student can feel the structure. The student who built the structure needs to remember what he/she built as to correct the other student, or they may write it down while the other student is feeling the structure.

Lesson Learned: *Working in pairs the children learn to use touch to observe a structure.*

Famous LEGO Cities

LEGO Smart Creativity Contest Entry

By Cheryl Falvo, Crossroads

As students study specific era's, for example ancient Rome, they will discuss specific buildings

and landmarks. Students will break up into groups, each group choosing one specific landmark or building. Students will need to construct a 'to-scale' representation of ancient Rome. This activity will encourage across the curriculum learning of math and history. Groups will need to collaborate with each other on deciding size and location for each landmark or building as they remember it from their lesson.

Lesson Learned: *Mathematical skills, team building skills, communication skills, and comprehensive skills.*

Building For Balance

LEGO Smart Creativity Contest Entry

By Deborah Williams, Jefferson County School System

Students are directed to form a shape with a narrow base out of LEGO bricks. They are challenged to form the same shape with their bodies. Students then attempt to blow their shape over to test its stability. The activity is repeated and students are directed to form a shape with a wide base out of the bricks, imitate the shape with their bodies and then attempt to blow it over, again testing the object's stability. Teacher-led discussion follows the activity and allows students to describe, compare and contrast the differences in the balance and stability of the two LEGO shapes as well as the body shapes.

Lesson Learned: *Students learn how the width of an object's or a person's base affects balance.*

Byzantine Mosaics

LEGO Smart Creativity Contest Entry

By Dawn Burhans, Pacheco Elementary

As a wrap up to Byzantine mosaics, students will work in teams to design and create a mosaic using LEGO bricks that will represent what they learned about the Byzantine era mosaics. They will then do an oral presentation to the class about their design. 1. Teach about Byzantine art form and culture, using the Internet to retrieve pictures to show the students. 2. Collect boxes (pizza boxes are perfect) that will hold the loose bricks and finished project. 3. Break the students into pairs. 4. Have them design and build a Mosaic that they can build with the bricks that will fit within the box. This is the part of the project that will require the most flexibility in time. 5. Have the students present their finished design to the class, being sure that they share how their design reflects the Byzantine culture.

Lesson Learned: *Team building skills; public speaking skills; research skills; design & creativity skills;*

Airplane

LEGO Smart Creativity Contest Entry

By Karen Webb

Start with body, go to wing span end with tail.

Lesson Learned: *how to design aircraft.*

Sort and Create

LEGO Smart Creativity Contest Entry

By Nina Smith, St. Catherine of Siena

This activity is to be used with a specific number- the number should be discussed prior to the activity and students should be able to count to that particular number. Each student will receive a bag with anywhere from 30-100 bricks (Depends on time, amount of LEGO bricks and teacher). Students receive a mat with three sections, labeled 4, 6 and 8. Students will be asked to sort their bags into the three groups. Talk about the numbers on the top of the paper- what does each number look like. After sorting: Discuss which group had more and which group had the least. Discuss other ways to sort the bricks. Then allow the students to create something using today's number- for example today's number is 6- we can only build something with the bricks that have 6 studs on the top. Discuss what students created and inquire about the ease or problems of the activity. Students then respond on their paper: Today I created something using bricks with only 6 studs. (Write the number 6)

Lesson Learned: *Through this activity student sort LEGO bricks by the number of studs on the top and are then asked to create something using a specific number for the day. This activity is designed for small groups.*

Making Letters

LEGO Smart Creativity Contest Entry

By Virginia Goodwin, Mayberry Elementary - Henrico County VA

Students will be given a period of 5-10 minutes to "explore" building straight structures and curves with the LEGO Smart Kit. Students will discuss the shapes of the letters of the alphabet, focusing on the curves and straight line components of each letter. They will be given 15 -30 minutes to choose and construct as many letters as they can and will verbally identify each letter and the shapes incorporated.

Lesson Learned: *Students will learn to problem solve to determine how to construct the letters, make decisions about which letters would be easiest to make, and they would have to work in groups or with partners to build them. They would use cooperative learning, as well, as eye hand coordination skills to model the letters.*

Balance 4

LEGO Smart Creativity Contest Entry

By Dale Pormann

Starting with a six LEGO bricks on a table. (lay flat and up) Then using no more than four attaching points, build a tower as high as possible, while keeping it balanced and standing up.

Lesson Learned: *Learn balance through tactical placement*

Building Good Listeners

LEGO Smart Creativity Contest Entry

By Kathleen Robinson, San Juan Del Rio Catholic School

In teams of 2, students will each have same amount, color, and shape of LEGO bricks. Each

child will have a flat baseplate on which to build. Place a file folder/piece of cardboard in between 2 players so that they cannot see each others boards. Person 1 will build something while telling person 2 each move they make. The Person 2 has to try to build the same thing using only person 1's verbal instructions. When person 1 is finished they check to see if their partner has created the same thing. Then they can reverse positions and do it again. It is an great way to enhance vocabulary skills in the early years! (This is especially wonderful for Pre-K and Kindergarten, but can be adjusted for any age).

Lesson Learned: *Team building, communication skills, listening & following directions, fine motor skills, number, shape & color identification, vocabulary building and fun!*

Wheel of Fortune

LEGO Smart Creativity Contest Entry

By Jackie Brannon

Prepare a "Wheel of Fortune" on a piece of cardboard. Divide the wheel into five sections and color it in five brick colors - one color for each section. Each student spins the wheel and picks out a brick in the same color as shown on the wheel. Everyone spins five times. Each student then has to build an animal, a robot, a weird creature or a friend using the bricks he or she has collected. Make up little stories about the models. Extend the game by increasing the number of spins and bricks per child.

Lesson Learned: *Identifying colors Counting to 5 Building 3D models*

Counting and Sorting

LEGO Smart Creativity Contest Entry

By Liska Garcia Rovi, Imagine School at Land O' Lakes

Divide the class in groups of 2-4 players. Each team is given a set of LEGO bricks to count and sort. Once they have sorted the bricks by color they must make a tower per color and count how many pieces in each. Then they must graph their results.

Lesson Learned: *Students will be able to count to 20 and sort the LEGO bricks by color.*

Mirror, Mirror Build It Tall

LEGO Smart Creativity Contest Entry

By Laura Woodall, Sheridan Intermediate School

First, pass out identical LEGO Smart Kits to each student. Tell them to first watch you build a castle for the evil witch in Snow White. Then have them each build the same castle. That wasn't so hard but could you build it "mirrored" or backward. Have the students tear down the model and then rebuild it in mirrored fashion. Next, Pair the students with their classroom partners, students with first names starting with earliest letter in alphabet are the "ALPHA" teammate. Have the Alpha build a castle and the "Beta" mirror it. First team to complete correctly wins 5 points. Now the fun really begins - Rotate Alphas clockwise around the room changing partners with each round of the game. The Alphas and Betas with the most points at end of game time win a prize- LEGO bricks? Maybe. . . Additional Parameter changes: 1. Reverse Alpha to Beta roles every other time. 2. Have Alpha and Beta work together to achieve mirror image of the castle. 3. Allow no talking-only non-verbal communication. 4. Insist on lots of talking the Mirror builder through. Analysis: Have students discuss the game. Was it easier to be the Builder or the Mirror? Did it help to have help building the mirror? Sometimes help isn't so helpful. Did

the number. Students help to have help explaining the number. Sometimes help isn't too helpful. Are talking help or hurt the speed of completion? Was it fun? A keeper lesson? Would they play it differently? What could be added to make it more fun?

Lesson Learned: *Students will work collaboratively with different class members as their team*

changes, building new working relationships. They will also improve hand-eye coordination, visual perception skill and verbal and non-verbal communication skills.

Asgo el LEGO Correcto! (Grab the Right LEGO!)

LEGO Smart Creativity Contest Entry

By Emily Jacobs, Kerr Middle School

Teacher Preparation: For each LEGO brick in the kit, the number of studs and the color of the brick should be written on a notecard IN SPANISH. A set of brick notecards should be prepared for every pair of students. Each pair should have a bag or bowl containing a complete LEGO Smart Kit, and a set of notecards as explained above. Pairs will take turns drawing a card and matching it with the appropriate brick. The pair that has all of their cards correctly matched with bricks first wins a special treat.

Lesson Learned: *Students will gain understanding of the Spanish language, including numbers and colors. They will also improve teamwork and communication skills.*

Create Anything

LEGO Smart Creativity Contest Entry

By Cathy/Kenny Malczynski, Home School

Each student uses all the bricks from one LEGO Smart Kit. Use your imagination and create anything you want!

Lesson Learned: *You can create anything your imagination allows!! Have fun!!*

Creating With Primary Colors

LEGO Smart Creativity Contest Entry

By Cathy/Kenny Malczynski, Home School

Give each child one LEGO Smart Kit. Have them pull out the primary colors. Use them to create an object. Name their object.

Lesson Learned: *primary colors*

2D-2-3D

LEGO Smart Creativity Contest Entry

By Jeremy Davidson, Central Coast Preparatory School

Allow approximately 5 minutes for each Step 1 and Step 2. Initially, use only a black pencil.

Note: Student A will need to disassemble his building. You may need a digital camera to capture the exact image of his structure. Step 1: Student A creates a particular LEGO structure and copies the pattern on paper, using a black pencil. Step 2: Without viewing student A's model, Student B must interpret and recreate Student A's structure from his drawing. Student A should

not be available to prompt Student B. Step 3: Afterwards, Student A compares his original structure to Student B's interpreted structure. If any help is necessary at this point, Student A may proceed to communicate any necessary details to enable Student B to build the exact same structure. Step 4: Discussion Questions: Did student B interpret and build precisely what Student A originally designed?? Did both structures resemble each other? What similarities and/or differences did you notice? Why do you suppose the final results are different or the same?? How could the results be exact? Did Student B enhance Student A's original design??? (a different perspective could possibly promote a better design & building) How could Student A convey more concise ideas on paper, in order to ensure the exact same structure. What challenges did you face and could some or all misinterpretations be avoided? How is this possible? Step 5: Variations: Reverse roles of Student A and B. Set a time limit for drawing and building. Only use a black pencil for drawing. Use colored pencils for younger students.

Lesson Learned: *Students will learn how to create a 3 dimensional building from a 2 design. Students will learn the importance of communicating and conveying their ideas succinctly from a detailed drawing in such a way, which will enable the builder to interpret and produce the concise envisioned final outcome. (the structure) This exercise reveals the challenges and importance of the relationship between architects, engineers and general contractors.*

LEGO Bridges

LEGO Smart Creativity Contest Entry

By Jerra Curnutte, Cabell County TAG Group

Allow student creativity to build a sturdy surface to bridge two surfaces.

Lesson Learned: *Bridge construction*

LEGO Manipulatives

LEGO Smart Creativity Contest Entry

By Jessica Steele, Home school

1. Sort and count LEGO bricks by color (use approximately 100 pieces) 2. Create a bar chart with number of bricks based on color

Lesson Learned: *Home school group used bricks as manipulatives to sort and create a bar chart.*

Team Build

LEGO Smart Creativity Contest Entry

By Luke Johnson, Spry Elementary

A group of students sit in a circle with one or more LEGO Smart Kits. A student starts by combining any two bricks in any way. The student passes the shape and the next student adds a brick. The object of the game is to create the best object (animal, vehicle, etc.). Students may not influence each others' decisions, nor can they move any previously added blocks. Each student is independently responsible for the groups final result. The activity is over when all the blocks are used, or all students added a block to the shape. This can be played in teams, where the winning team has the best looking design.

Lesson Learned: *Students will learn to expand on ideas, think outside the box, and creatively*

problem solve. They will work as a team, but learn to express their own opinions as part of a group.

Discover Attributes with LEGO Smart

LEGO Smart Creativity Contest Entry

By Katie Watson

Explain the concept of "attribute" to students. An attribute is a way to describe something--for example, color is an attribute. Have the students pick out things in the room that have the attribute of being blue. Shape is also an attribute, so have them pick out things in the room that have the attribute of being round. Sort kids by attributes (hair color, long-sleeved or short sleeved shirts, etc.) and give other examples until it seems students understand the concept. Then, give each student a set of LEGO Smart bricks. Have them pick one attribute to sort their bricks by (examples could be number of studs, color, thickness, has an eye/doesn't have an eye, etc--but don't give students examples this time). Once their bricks are sorted, a partner should see if he/she can guess what attribute the bricks were sorted by. Then, have the students try to sort a new way. See how many different attributes of the bricks the class can discover.

Lesson Learned: *Critical thinking, analysis, logical thinking*

LEGO Classification Systems

LEGO Smart Creativity Contest Entry

By Maura Neill, JCMS

1. Students will design a classification system for LEGO bricks based on their own set of criteria.
2. They will divide up the bricks in their kit based on this classification system.
3. They will record the data of how many bricks fell into each category.
4. They will write up a description of their classification system and share this with their classmates.
5. They will compare the systems designed by their classmates looking for differences and similarities.

Lesson Learned: *This activity will involved thinking level skills of application of student knowledge to first evaluate and then create a new classification system. It will involve team building, problem solving, communication through writing and sharing as well as realizing that there is more than one solution to a problem.*

LEGO Shadows File Folder Activity

LEGO Smart Creativity Contest Entry

By Tomi Lessaris, Kid Company of Franklin

Connect 3-7 LEGO bricks into a two-dimensional (well-almost) shape that will lay flat on its side. Photograph the construction and print it in black and white in life-size scale. Repeat several times, using remaining bricks. Glue photos to the inside of a file folder, then cover with clear adhesive film. Let the child reproduce the shapes in the photos with the bricks and lay them on top of each photo. There should be no left over bricks when completed.

Lesson Learned: *hand-eye coordination; visual discrimination; shape identification; fine motor skills*

Stable Structured Creations

LEGO Smart Creativity Contest Entry<

By Kelly Payne, Calvary Christian School

Students will be placed in groups of two or three. Each group will work as a team to build the tallest stable structure using the 20 LEGO bricks. Team work is essential because student 1 can not build with their brick until student 2 and 3 have attached their brick to the structure. Each student has to take their turn laying down the foundation. After groups have finished, we will discuss what formations made their structures more stable. (Example: Arches are structurally sound.)

Lesson Learned: *Students will explore geometric formations by using critical thinking skills as they work with team members to complete the activity.*

Bird's Eye View of the Room

LEGO Smart Creativity Contest Entry

By Jean Turney, St. John The Baptist

Using the floor tiles and painters tape to label numbers and letters onto the floor, the classroom is transformed into a giant grid. Students are each given a piece of graph paper and are asked to create a model of the floor by drawing lines to represent the perimeter of the classroom based on the number of floor tiles. The room is then divided into sections for each team of students. Students are then responsible for building what is in their section of the classroom using the LEGO bricks in their LEGO Smart Kit. Then the students have to decide where each item would be placed on the model of the classroom. Structures are easily placed on the model by having students use the graph paper to represent the raised circles on the bricks. Desks and other classroom furniture can be located by counting the number of dots over and the number of dots up to where the corner of the furniture is found. When everyone agrees that the classroom has been accurately represented on the model, it is valuable to demonstrate the differences between the panoramic view and the aerial view of the classroom model. Small groups are now responsible for creating a map of the classroom. Aerial view maps can be difficult for third grade children, but when they are drawn from a model that the children can stand above and see all at once, it becomes achievable.

Lesson Learned: *map-making, understanding grids, comparing panoramic views and aerial views, using graph paper*

Don't Tell Me She Can't

Recently we received this story about the impact hands-on learning can have on students who face special challenges in life. Thank you Bettina Hopcroft for sharing your tale of success!

I work with a 7 year old girl in 2nd grade - she has CP and her right hand is not much functional. She is right handed, but has to use her left hand to do stuff. I gave her the LEGO Smart Kit and asked her to built me a biiggg tower. She did, it took her a while, but the PT and OT said -- this is great for her small motor skills -- I will be doing this 3 times a week with her!!! She always gives me a different tower!! Don't tell me she can't do it -- she sure can! - Bettina

Look. Run. Make

LEGO Smart Creativity Contest Entry

By Jerry Smith, Oveta Culp Hobby Elementary School

I created a shape using the LEGO bricks in the LEGO Smart Kit. I placed it behind a privacy folder so the students couldn't see it. I split the class into teams of 3. Each person was given a job. Person 1 was the looker, 2 was the runner, and 3 was the maker. Person 1 looked at my creation and using only their words (no hands!) told person 2 what they saw. Person 2 "ran" to person 3 and told them what to build. Person 1 could say whatever they wanted, and person 2 could make as many trips as they needed to get the job done. The group that correctly finishes first gets a prize. After we finished I spoke to them about using good specific details in their writing. I then had them "draw" me a picture with their words describing the figure I made.

Lesson Learned: Team building skills, following directions, giving details in writing, communication skills, words choice

Flower Frenzy

LEGO Smart Creativity Contest Entry

By Sylvia LaFond, LaFond Home School

Each student uses the Yellow, Orange, Green, Pink, and Red LEGO bricks in their kit to make a flower. They can use some or all of them. When they are all done they compare their flower to the other student's flowers.

Lesson Learned: Everyone sees things different.

FLOAT? SINK? THINK!

LEGO Smart Creativity Contest Entry (OCTOBER WINNER!)

By Renny Fong, Public School 130 Manhattan

Before demonstrating to the class, have two LEGO Smart Kits prepared, one with all the pieces loose and one with all of the pieces clumped together into a random structure. LESSON 1 - Demonstration 1. Prepare a tub of water. 2. Have students pair up in teams. 3. First, show the students the Smart Kit where all the pieces are loose. Ask the students what they think will happen if we pour all of the pieces into the water. Think, pair up with their partner to discuss, then share with the class. 4. Pour the pieces in. If digital camera available, film it. Discuss. 5. Now, show the students a kit where all of the bricks are clumped together into a "structure." Ask them to predict again what will happen. Will it sink or float? Will it stand upright, tip to the side? Think, pair, share. 6. Place the "structure" into the water. Film, if available. Discuss. 7. Have students write down what they observed and learned from this activity. 8. In preparation for the next lesson, students can sketch a structure that they think will stay afloat and balanced and explain why. LESSON 2 - Experimentation 1. In pairs, ask the students to build a structure that they think can float and stand upright and balanced in water. After students have built the structures, take pictures of the structures, and have students write down why they think their structures will stay afloat and balanced. Where did their ideas come from? 2. Perform experiment. Each group presents and puts their structures into the tub, one by one. 3. After the experiment, discuss with the class what commonalities they see in the structures that worked the best. Do these structures resemble real life examples such as boats, ships, animals, etc.? 4. Students journal about their experiments. Lesson 3 - CHALLENGE 1. For another experiment, what would happen if we added rocks or coins or marbles to their structures? 2. How many do they think their structures can hold before sinking? 3. Which structure do they think will work the best? Why? 4. Let's experiment!

Lesson Learned: Students will work collaboratively use the Scientific Method in an interactive way, where they will hypothesize and test, "What makes things float and stay afloat?"

LEGO Memory

LEGO Smart Creativity Contest Entry

By Bridget Jones

Divide the children into teams of two and give each team one LEGO Smart Kit. Child A sits with his back to Child B who then builds something using the bricks. After 3 mins, Child A is allowed to view the created object for 1 minute. The object is disassembled and then Child B has to recreate the object. The team switches places and Child B has the opportunity to build while Child A has to remember the structure.

Lesson Learned: Imaginative play, memory skills

LEGO Roll

LEGO Smart Creativity Contest Entry

By Dennis Gard, Home school

Setup: Open the LEGO Smart Kit and remove the green square. Get a piece of construction paper and using the green square brick, draw squares on the paper to make a game board. The squares should touch so players can move from one square to another. Select one square to be the starting point and one to be the finish. You might want to even write start and finish in the squares. Remove the two orange bricks and the black trapezoidal brick. Set them aside to be used as dice in the game. Have each player build a shape to use as a piece to move along the board. How to play: Each player rolls the orange and black trapezoidal shaped pieces. Count the number of studs that are pointing up. Move that player's shape across the board one square for each stud. The player to reach the finish square first wins.

Lesson Learned: Counting, team building, communication

Linnaeus' LEGO

LEGO Smart Creativity Contest Entry

By Jackie Johansen, Julian Charter School

1. Briefly review concepts of classification. Give examples of how we order things such as items in a grocery store, shoes in a closet, books in a library, etc. Let them know that scientists use classification to keep things organized. 2. Tell the students that they will have to create their own system of organization using the items that they are given. The system will have to make sense, and be agreed upon by their entire group. 3. Break students into groups of 3-4 or have them work with their table group. 4. Requirements: After classifying the objects by site, write the basic components that make each group unique. Each group must have at least 2 LEGO bricks in it. 5. Give each table a set of LEGO Smart Kits and tell them that they will have 5 minutes to classify the objects. 6. Students will spend their next 5 minutes writing basic classification components of each group. 7. The teacher will ask a few groups with original ideas to present their ordering to the class. ***8. As a follow up enrichment game, or as a GATE challenge activity, hold up a few "Extra" bricks that were not included, and have students point to which group within their system they would belong to. ***9. As another extend activity, you could rotate groups to look at one another's ideas and decide where they would put in "Extra" pieces. "Extra" pieces may not fit anywhere and would need to be put in a separate group.

Lesson Learned: Students will create a classification method using a set of LEGO bricks.

LEGO Math Equations

LEGO Smart Creativity Contest Entry

By Austin Rudd, home schooled

Children can use LEGO bricks to see how many math equations they can form and solve in 10 minutes with only the LEGO Smart Kit. The student who forms the most equations wins all the bricks!

Lesson Learned: Gives students a new way to do math problems in a hands on way. Studies show that people retain more when hands on methods are used. Can be used with simple addition all the way up to algebraic equations.

Construct A Useful Vehicle

LEGO Smart Creativity Contest Entry

By Russell Abe, Webling Elementary School

Bricks from the LEGO Smart Kit along with other spare parts from other sets are given to students to give them the greatest possible range to invent a vehicle. Students in group needs to be in consensus and a survey as far as the needs to be taken.

Lesson Learned: Students will learn how to work together as a team to brainstorm an idea to plan, design and build a vehicle that would meet the needs as many people as possible to the fuel costs and traffic problems.

LEGO Graphing

LEGO Smart Creativity Contest Entry

By Nathan Stone, home school

In the first 10 minutes, the instructor should explain the concept of a histogram (binning data) -- the creation of bins and counting of elements that fall in the bin. In the second 10 minutes, students should look for at least 4 types of concrete items in or around the room that can be

differentiated from one another (teaching discernment) and count all such items in the vicinity. They will then lay out LEGO bricks in lines whose length corresponds to the counted items -- perhaps tying the bars together via flat pieces. In the third 10 minutes, students will show their newly formed graphs to others in the room confirming their counting methodology, and providing a presentation opportunity.

Lesson Learned: Students will learn how to generate and read 2D and 3D graphs to convey numerical data to other people.

Color Challenge-Outdoor Nature Study

LEGO Smart Creativity Contest Entry

By Barbara McCoy, Harmony Fine Arts Home school

1. Place LEGO bricks in a bag. 2. Once outdoors in your backyard, park, or schoolyard, pull one brick out at a time and try to find something in nature that matches the brick's color. (green for

some grass, yellow for a flower, orange for some pollen, etc) 3. Continue pulling bricks until you have found something for each color in the bag. 4. As a bonus, use the piece with an eye to match to something you found that is a living creature, perhaps an ant or a bird. This activity will help children to learn to really see what is in their environment close at hand. Matching the colors of the bricks to objects they observe closely will help them learn about concepts of camouflage in nature as well as patterns and colors. Is that tree trunk really brown or is it actually another color? Taking time to notice the little things around us is a skill all children need for many more complex learning tasks.

Lesson Learned: *Outdoor education, nature study, patterns and color in nature, visual discrimination, use of camouflage in nature.*

LEGO Town 2

LEGO Smart Creativity Contest Entry

By Tammy Baynard, Peoria Family YMCA

The students are split into 2 teams. They need to design their town with landmarks, bridges, rivers, etc.. once they design it they need to be creative and use materials we give them with LEGO bricks.

Lesson Learned: *Team building.*

Technical Drafting

LEGO Smart Creativity Contest Entry

By Teresa Johnson, Social Circle High School

Students are given a set of LEGO bricks and instructed to build something. It does not matter what they build. Students are then instructed to sketch or draw their model using the rules of orthographic projection. Showing the front, top, and right side view of the model they have built.

Lesson Learned: *Students gain an understanding of orthographic projections and full scale drawing.*

Mirror Image LEGO

LEGO Smart Creativity Contest Entry

By Anna Liao, CHEP North

Students pair up to form teams. Each team decides which teammate will build first onto a baseplate. The builder will have 10 minutes to build something on half of a LEGO baseplate with bricks without his or her partner watching. After the 10 minutes are up, the builder hands his work over to his or her partner who then has to make the mirror image of the original. After completing the build, the teammates look over their combined efforts and see if their combined efforts produce a symmetrical image.

Lesson Learned: *Students will learn teamwork and develop their understanding of geometric symmetry.*

3-D ABCs

LEGO Smart Creativity Contest Entry

By Anna Hughes

1. Have each student build a letter of the alphabet using their own LEGO Smart Kit. It could be built 3-D or it could be built by placing the bricks side-by-side. 2. After each child has chosen and built a letter, ask the child to build an object that begins with that letter. For example: the letter 'H' could be built and after completing that, the child could build a horse, house, or helicopter. 3. Ask each child to present their object to the class. For example, "I chose the letter

'H.' I built a helicopter because helicopter begins with an 'H'." 4. Ask all the children to repeat in unison, "H-H-Helicopter starts with H."

Lesson Learned: *phonics, hand-eye coordination, forming alphabet characters, public speaking, creativity*

Neil Armstrong and the Tin Goose

LEGO Smart Creativity Contest Entry

By Celeste Hester

We had this idea after reading The Childhood of Famous Americans book on Neil Armstrong. When he was 6 years old, he took his first flight on an old airplane with his father, which is where he fell in love with flying. This activity helped the children build the "Tin Goose", which was the name given to the old Ford Tri-motor plane which took Neil closer to his dreams of flying. Steps to building the Tin Goose: 1. Take the rectangular 2x8 LEGO brick. This will be the 2nd layer from the bottom, but we'll build off of this piece. 2. The bottom layer will help stabilize the Tin Goose. Place the 2x8 brick vertically in front of you, and place a 2x4 brick underneath it and even with the front of the plane. Take a 1x6 and a 1x4 brick to be the wheels. Place the longer one at a right angle flush to the 2x4 just placed. Be sure it is symmetrically placed. Next place the 1x4 flush with the bottom end of the plane, also symmetrically placed and at a right angle with the 2x8 brick. There will be a space between these two pieces just placed. Put a 2x2 square here to fill the spot. 3. The next layer will be built on top of the 2x8 brick. This includes the wings of the airplane. Take the slanted 1x4 brick and place it at the top of the 2x8 brick at a right angle and symmetric with it, with the slant going away from the rest of the plane. Next lay the short 4x4 brick flush to the slanted brick. Flush and at a right angle to this are two 2x6 bricks, symmetrically placed. You'll have a 1x2 space at the end of the brick. 4. The short 2x6 piece will go over these two pieces, with an equal amount over each one (symmetrically placed). Then a short 2x2 brick will be symmetrically placed on top of this piece. Place a 1x1 brick on top of this part to be warning light to other planes. 5. Next we will make the person (Neil) in the plane. Take two 2x2 bricks and place them one on top of the other. Next take a short 2x4 and place it flush on the top 2x2, with 2x2 overhanging towards the back of the airplane. This is Neil's scarf flying in the wind. Place the 2x2 piece with eyes on it flush towards the front, with the short 2x3 piece on top of that, as his hat. Place this entire person piece in the middle of the short 4x4 square. We'll now fill in the rest of the airplane. 6. Place a 1x2 brick directly in front of and behind "Neil" in the airplane. Place a 2x4 brick on the left side of Neil, with the longer side filling in against the short 4x4 (part of this brick will be hanging off of the 4x4 brick). 7. Finally, place the 2x3 brick on the right side of Neil, to secure him inside the airplane (with part of this brick also hanging off of the 4x4 piece). There is one 1x1 brick left. Place this on the last remaining part of the 4x4 short brick that shows, and you are ready to fly!

Lesson Learned: *creative thinking, symmetrical relationships, even and odd amounts, right angles and other spatial relationships, American history, following your dreams, good father*

angles and other spatial relationships; American history; realizing your dreams; good teacher role-modeling relationship (from the Neil Armstrong story)

Hands-On Picasso

LEGO Smart Creativity Contest Entry

By Kristen Shields, home school

1) Browse through art books. Point out the different styles Picasso used. Spend time musing over the odd ones, trying to figure out just how many people are in the picture or what objects they are using. Let the children guess what they are seeing. 2) Let students have time to think, and then build a Picasso-style statue using their LEGO bricks. There is no wrong answer ... let the creativity free! 3) Let the children show each other what they came up with, and describe what it's meant to represent. Take a picture of each child with his or her creation, if desired, and print out as a keepsake for the student.

Lesson Learned: Art Appreciation, Creativity, Building Skills

Structural Integrity

LEGO Smart Creativity Contest Entry

By Dawn McKinley

Using every LEGO brick in the kit, students build the tallest free standing structure.

Lesson Learned: There are many ways to build a structure, architects uses creativity and available materials.

Please Pass Notes!

LEGO Smart Creativity Contest Entry

By Cathy Ramirez, Orenda Education's Williams House School

Over the course of one week, share the Braille Alphabet with your students. Have them practice the letter patterns by "writing" in Braille. Since Braille letters are constructed by placing a group of dots within a 6 block grid, LEGO bricks with 6 studs work the best. Have students take bricks and paint liquid stamp ink on the studs in order to stamp them on a sheet of paper. Have your students choose a friend in the room and ask them to write a note to their friend in Braille using the LEGO stamps.

Lesson Learned: Students will practice identifying patterns. Students will gain exposure to other methods of communication. Students will practice the Braille alphabet.

Walk Around The Brick

LEGO Smart Creativity Contest Entry

By Belinda Van Norman, Southwest Laurens Elementary

Students will break into groups of 3 or 4. Each group will have different sized and shaped LEGO bricks. Using the small studs as the bricks, the children begin to understand how to count area and perimeter. With the standard rectangle brick they would use the studs to determine that it has an area of eighth, as well as a perimeter of eight.

Lesson Learned: Students will learn area and perimeter using different LEGO bricks.

Lines Of Symmetry

LEGO Smart Creativity Contest Entry

By Christy Vilaire

This activity is used to follow up a lesson on symmetrical and asymmetrical figures. Have students work alone or together to use as many LEGO bricks as possible to create symmetrical figures. Students will compare their figures with other students checking each others work for symmetry. Divide the creation into two different groups: symmetrical and asymmetrical.

Lesson Learned: *Students will learn to build objects that are symmetrical and asymmetrical.*

Bridge Building

LEGO Smart Creativity Contest Entry

By Mandy Byrne, Boyle County Middle School

Working in pairs, instruct students to build the longest bridge between 2 sets of 5 stacked

textbooks. The bridge should be built to withstand the most weight with their set of LEGO bricks within a 5 minute time period. When time is up, have students compare their bridges to others around the room. Test the bridges for their weight bearing ability. What types of structures are able to hold the most weight?

Lesson Learned: *team building, communication, problem solving*

Quick Pick-Up Bricks

LEGO Smart Creativity Contest Entry

By Laura Ringsmuth, home school

For every brick in the set you must write a multiplication flash card for it. Take 20 note cards and write the equation that corresponds to each of the 20 bricks. Example: For a 2 by 4 brick the equation would be 2×4 , etc. Put all of the bricks in a pile and place the flash cards face down beside the pile. Take turns flipping up one flash card. Once the flash card is up, the players must think of the answer to the equation. The first person to say the answer and grab the corresponding piece gets to keep it and the card until the end of the game. If a player says a wrong answer, or they pick up the wrong brick, they have to put the piece back and mix the flash card in with the remaining pile. When all the bricks are gone the game is over. Once the game is over players count the number of bricks they have. The player with the most bricks wins! For an extra challenge have the players blindfolded and choose someone to read the flash cards to them. Players will have to feel for the correct brick.

Lesson Learned: *The student learns to multiply easy multiplication problems quickly. Also, the student visualizes the multiplication problems.*

Writing And Collaborating

LEGO Smart Creativity Contest Entry

By Mark Witherington, Pulaski County Alternative Learning Center

Take a 4 x 2 orange LEGO brick and attach the yellow 4 x 2 brick underneath perpendicular so that there are 2 yellow studs on each side of the orange brick. The back of the 4 x 2 orange

that there are 2 yellow studs on each side of the orange brick. The back of the 1 x 2 orange brick needs to be flush with the yellow brick. At the other end of the 4 x 2 orange brick attach one 2 x 2 orange brick to the underneath corner so that only 3 arrange studs are seen-one in front and two to the side. Attach the 2 x 2 yellow brick to the other side of the orange brick on top. Attach the 2 x 4 black slope piece to the top of the 2 x 4 orange piece. The slope is also perpendicular to the 2 x 4 orange piece. This slope should be centered with each side out one place from the orange piece. On the opposite end of the orange piece attach a 2 x 3 red piece on so that 2/3 is sticking out. Set this completed structure to the side. This completes the dog. The alien boy is next. Attach the 2 x 2 with one eye (yellow) perpendicular and in the center on top of a green 1 x 4 piece with one of the eyes flush to the 1 x 4 green piece. Underneath the far side of the 1 x 4 green piece attach a green 1 x 2 so that it is protruding outward. Do the same thing with the 1 x 2 yellow piece to the other side of the 1x 4 piece. This completes the structure. The space ship is next. Center a 4 x 4 flat lime green piece perpendicular on top and flush it to one end of a 2 x 8 blue piece. Take the gray 2 x 6 and attach underneath the lime green piece so that only four are attached and the back part of the gray piece is protruding beyond the flush lime-green piece and blue piece. Do the same thing with the green piece on the other side. This is the back. On the front attach a gray 1 x 3 piece on top of the blue 2 x 8 piece so that 2/3 is pointing forward. Take the 2 x 2 white and attach on top of the exposed area of the blue piece flush against the lime-green 4 x 2 flat piece. On the corners of the 2 x 2 piece attach the 1 x 1 pink piece. At the back design a tail for the aircraft. This is the space ship. The student will write a manual using the pictures taken from each piece. Students will learn how to attach pictures using a table and learn how to write a brief description of each. Students will also write a narrative story along with a simple dialogue for a short storyboard that will involve making a movie. This story will include the three pieces of structure, the alien dog, the alien boy, and the alien spaceship. The guideline of the story is under the synopsis that the boy lost his dog and is using the spaceship to find out where the dog is in the solar system. After the script has been written, it needs to be placed in a stop-motion format using the software Claymation Studio that has a chroma key. The chroma key allows the background to be anything such as the surface of Mars. Using a webcam or any digital camera through the chroma add the appropriate background. Place the alien dog in the view of the camera. Before taking pictures make sure a folder has been created to hold all the pictures. Take several pictures of the dog running around in circles. To do this, barely move the dog ahead before each picture. . Then complete the rest of the storyboard according to the students' scripts. This is the sop part of the stop motion animation. Most computers that run Windows XP will have Moviemaker on them. To import pictures click on the import pictures icon in Moviemaker, locate the folder of the pictures click on it. To import the pictures hit ctrl A and all the pictures in the folder will be download in the order they were taken into Moviemaker. After the pictures have been downloaded click ctrl A on the first picture and drag them to the empty storyboard. Go to the edit tab and click option, then click advanced and set picture duration to 1 second. Using the webcam or a microphone, record the dialogue written out by the students in place the dialogue in a folder. Record each line and save it as line 1, 2, etc. In the movie maker dialogue box click on import audio, then locate the folder and slide in each audio snipit into the timeline spot that has audio/music. To adjust the dialogue with the movie, click on show timeline and place the cursor in between the two frames to adjust and a double red arrow appears. Move the slide to be longer to match the dialogue. When finished, click on save movie file and click on play back on computer. Once saved, open the movie file in Moviemaker and drag it into the time line and add sound affects from a sound effect cd. Resave the movie.

Lesson Learned: *Students will learn how to write an expository assignment. Students will also develop a storyboard with a written plot and include a dialogue. The finished product will have merged technology , computer experience, and middle school English standards.*

Get To The Moon

LEGO Smart Creativity Contest Entry

By Raul Beascochea, DAG - Disability Awareness Group

Items needed; engine parts, wing parts, body parts, crew members, rocket part or space ship parts. Who would you take with you? What would you need to survive in space? What would you need to survive in space? How long will it take to get there? Who will plan the trip? How will you get back? How many people will be needed to plan trip?

Lesson Learned: *Skills learned; Being part of a team, learning to share ideas and listening to others point of view. learning how important communication is.*

100 Dots

LEGO Smart Creativity Contest Entry (GRAND PRIZE WINNER!)

By Colleen Dixon, Mountain View

This activity is for K-3 students. Using the LEGO Smart Kit the student will build a creation that, when viewed from above, will show exactly 100 LEGO dots. Students should compare how their creations are similar to and different from each other. Students should discuss and share strategies for building their creation so that exactly 100 LEGO dots could be seen.

Lesson Learned: *Critical thinking and problem solving skills; counting to 100*

Chain Reaction

LEGO Smart Creativity Contest Entry

By Kim Roberts, home school

Place the pieces of the Lego Smart Kit in a bag and have each student take a turn drawing one

brick at a time until all bricks were drawn. One student begins by placing one brick on the table while telling the beginning of a story. Next, the other student continues the story - adding in her part while attaching a brick to the first one. This continues until all the bricks are used and a story is created. The creation with the bricks helps each student to retell the story, as each brick represents a "piece" of the story. Their LEGO bricks "told" the story they made together.

Lesson Learned: *Students learn to work together and build off one another's ideas.*

Build It Bigger, LEGO It Larger

LEGO Smart Creativity Contest Entry

By Nancy Wagner, Kerr Middle School

Students will form teams of two and will be given a LEGO Smart Kit. Teams will be instructed to build a structure using only the bricks that will stand on its own. The only guidance given is that they should try to make it as "big as possible." After completing the build, teams will use a millimeter ruler to measure each side of their structure. They will use these measurements to calculate the surface area of their structure. Then the teams will use their measurements to calculate the volume of their structure. Each team's results will be entered into a chart on the chalkboard. Students will then work individually to make a double bar graph containing each team's results. The class can then discuss what it means to be "biggest," and whether the largest surface area necessarily has the largest volume.

largest surface area necessarily has the largest volume.

Lesson Learned: *Students will practice measuring, calculating piece-wise surface area and volume, data graphing, gain understanding of basic structural physics, as well as improve communication skills.*

Size Grouping/Sorting/Counting

LEGO Smart Creativity Contest Entry

By Maryrose Malzacher, Key Largo -pre-k

Students will learn to identify and group LEGO bricks according to their sizes. Students will count how many of each size in each group. Students can work alone or with others. Students will discuss and chart which group has more/less

Lesson Learned: *Students will strengthen their counting, sorting and grouping skills along with visual discrimination skills. In addition students will demonstrate understanding of concept of more/less by charting their result and by working together as a group enhance their cooperation (team building) skills.*

Travel the USA

LEGO Smart Activity

By Mary Schwartz

Using a MINDSPORMS Robotics Kit, students build a robot (with touch sensors). Using a large map of the USA as a competition mat, students will place their robots on a given state as their starting point. Their task can be as easy as moving their robots from one state to another or they can be given instruction on traveling to several states and back to the state in which they started. Bricks are placed around the edge of the map to keep it in place. These bricks can be used by the students, along with the robots's touch sensors, as part of their strategy to travel from state to state. Time the students to see who can complete the challenge in the least amount of time. Make it as easy or complex as you like. I have a large USA rug in my classroom that I use instead of a map.

Lesson Learned: *Students learn to build and program LEGO MINDSTORMS Robots in teams of two. Skills involved include: following directions, programming, team building, problem solving, creative thinking, all while becoming familiar with the location of the 50 states.*

Go Green

LEGO Smart Creativity Contest Entry

By Tamara LaCroix, Ouida Springer Elementary

Students will begin by brainstorming and discussing environmental issues and areas where they see a need for improvement. Some amount of research may be done at this point as teams are formed to come up with creative solutions to the issues they choose. Finally, students are challenged to use LEGO bricks to design and build models or express the concepts and solutions they have come up with.

Lesson Learned: *In this lesson students will contemplate how design engineers would approach an environmental problem. They will be encouraged to come up with creative solutions and designs that would improve our world. The lesson will target team building skills, environmental awareness. and foster creative thinking and interest in engineering.*

Patterns

LEGO Smart Creativity Contest Entry

By Suzette Burt, Dawson Head Start/Pre-K

This lesson is for Pre-K students with a non-English speaking student. Divide students into groups of two. 1. Students will be introduced to a pattern group. 2. Each group is to create a pattern only using the LEGO bricks provided. 3. Each group must explain what type of pattern they created and why it's a pattern. 4. Each group will also learn the correct color name in Spanish.

Lesson Learned: *team building, pattern groups, English vocabulary*

Four & Eights

LEGO Smart Creativity Contest Entry

By Karen Goulandris, Hanna Perkins School

Each student begins with a teacher made work sheet that contains two columns. At the top of one column is a picture or drawing of a 2x2 LEGO brick and at the top of the other column is a picture or drawing of a 2x4 brick. The following should appear several times, under the first column: (blank)x (picture of 2x2 brick a.k.a. a "4") = _____ The following should appear several times, under the second column:(blank) x (picture of 2x4 brick a.k.a. an "8")= _____ Students will use the twelve bricks supplied in the LEGO Smart Kit. Place the bricks in a plastic container with a lid and secure the lid. One student shakes the pieces, removes the lid and pours the pieces onto the table surface. Only the bricks that land "studs up" will be used for that turn. The student counts how many 2x2(a.k.a. 4's) bricks landed with "studs up". Student writes that amount in the blank space before the picture of the 2x2 brick (a.k.a. a "4"). The student will count the number of studs on all of the 2x2 (a.k.a. "4s") bricks that landed with "studs up". This number is placed in the space after the picture of the 2x2(a.k.a. "4") brick. This leaves the student with a completed equation, for example, 3 x (picture of 2x2 brick a.k.a. "4") = 12 The student continues with any 2x4(a.k.a. an "8") brick pieces that landed with "studs up" and completes the equation in that column. Continue with players taking turns for the time allowed for the activity. The following LEGO Smart Kit is used for this challenge. Qty. 2- 2x4 bricks yellow Qty. 2- 2x4 bricks white Qty. 2- 2x4 bricks black Qty. 2- 2x4 bricks red Qty. 2- 2x2 bricks red Qty. 2- 2x2 bricks blue

Lesson Learned: *Math skills are strengthen as students use cooperation and language skills to play the "Fours & Eights" game.*

Fraction Fun 2

LEGO Smart Creativity Contest Entry

By Lisa Coburn, Abbotts Hill Elementary

Students should already have some understanding of fractional parts prior to the activity. 1. Allow students to take a moment to play and explore the LEGO bricks in their kit. 2. Give students a work mat (plain piece of paper works well). Ask students to show different fractional parts. ie. 1/2 yellow. 3. Have students compare and observe other group members work and discuss if multiple answers can be created and how they are different. 4. Continue a few more examples as a class. 5. Give partners a sheet guiding them to continue to find fractional parts to solve together. Work toward more difficult challenges, such as having the students to find what

solve together. Work toward more difficult challenges, such as having the students to find what fractional part the flat green pieces is if the whole is the orange rectangle.

Lesson Learned: *Students will explore fractional parts by using LEGO bricks. They will work with a partner to build and identify relationships and compare fractions that were created using bricks.*

Going Up - Going Down Symmetrical Steps

LEGO Smart Creativity Contest Entry

By Karen Goulandris, Hanna Perkins School

Students will investigate basic line symmetry by building a set of steps going up and then a matching set going down. Working in small groups will help to strengthen communication skills between students as they may coach, correct and demonstrate to their peers. Explain to the students that they will need to build a set of steps going up and then a matching (symmetrical) set of steps going down. Ask the students to use as many of the bricks in their set as possible. Students should connect the pieces of the steps in such a way so that no bricks come apart when the structure is lifted from the table surface. The following LEGO Smart Kit is used for this challenge. Qty. 2- 2x8 bricks yellow Qty. 2- 2x4 bricks yellow Qty. 2- 2x4 bricks black Qty. 2- 2x4 bricks red Qty. 2- 2x3 bricks white Qty. 2- 2x3 bricks blue

Lesson Learned: *Students will work in small groups of 5 or 6 with each student having their own set of twelve bricks.*

Engineering Our World

LEGO Smart Creativity Contest Entry

By Marcella Bess, Home school

1. Cut out a river using construction paper. 2. Using the LEGO Smart Kit construct a bridge that will allow cars to cross the river. (repeat world activities having students build skyscrapers, house, etc.) Lastly have students construct something creative that they come up with. Have them write a report and/or present their construction describing what they see.

Lesson Learned: *Students will learn how to construct different projects in our world. Such bridges, skyscrapers, problem solving, and creating unique scenarios coupled with a story of their construction.*

LEGO Logic

LEGO Smart Creativity Contest Entry

By Cheryl McLaughlin, Lee's Summit R-7 Schools

Divide students into pairs with a screen between them. Each student arranges LEGO bricks in a straight line. Each student prepares written clues about the sequential layout of the bricks. Clues must be creative. The description needs to be definitive, but intentionally a bit elusive. Here's one logic problem example. "Two LEGO bricks of the same color are in the middle. A 1 x 1 is the fourth block away from the center. The first block is the same size block as the fourth block, but not the same color. The sixth block is neither a rectangle nor square shape. The flat 1 x 4 is two away from the yellow block. What order are the bricks?" Students trade their clues. Based on clues of the block's attributes, the partnering student attempts to solve the logic problem by using critical thinking to place the blocks in the right order. Teacher modeling

of one to two problems will improve the quality of the creative clues. Clues can be developed on the blocks' color, shape, size, or function. The logic problem can be made easier by creating a line of just a few pieces or limiting the number of the pool of blocks with which you are working. For more difficult challenges, lengthen the block sequence or require full usage of all the pieces.

Lesson Learned: *Logic enhances critical thinking and problem solving. Being LEGO Smart means challenging oneself mentally to increase mental sharpness and problem solving ability.*

Leadership

LEGO Smart Creativity Contest Entry

By Kenneth Gaylor, Western Michigan University

Break students into teams/units with leadership and chain of command. Use a developed, multi-segmented design. Student first echelon leaders will see the design and the instruction. Second echelon leaders will only read instruction. Workers are the only ones allowed to touch the LEGO bricks. First echelon leaders can not speak with workers etc. It can also be used as a competition.

Lesson Learned: *Use LEGO bricks as a medium for a team building activity. Students can learn leadership and how to designate responsibility while building something.*

LEGO-Matics

LEGO Smart Creativity Contest Entry

By Matthew Fox, USD 466

Activity 1. Build a structure. Have students estimate how many of what kind of LEGO bricks their are used for the Structure. Take apart the structure and count them. Find the difference in everybody's estimate. Next ask them from what they know how many bricks would it take to build a structure twice as big. Activity 2: Taking a flat brick with a large perimeter have the students count the studs on each side, add it up, and find the perimeter. Then demonstrate how it is important so the we know what and how many bricks to use for the perimeter. This will put an actual concrete example in their minds of why they need to know perimeter. The other activities will progress in the same way. The bricks will be a hands-on teaching tool for the students to better understand what they are learning and giving them an example that can sit right in front of them, while making it very fun!

Lesson Learned: *The students will learn to us better hand-eye coordination, estimation, perimeter, focus on arrays, multiplication, comparing Real-World structures to LEGO models. The students will also use the bricks to make 3-D Graphs for class. I believe the possibilities are endless and new opportunities to use them as a teaching tool will emerge throughout the years.*

LEGO My Library

LEGO Smart Creativity Contest Entry

By Andrea Moreau, East Hancock Elementary

My activity isn't really specific. Once a month students and families from my school gather in our school library for 2 hours to build and create with LEGO bricks. This is also a time for families to be together, to check out books together, and to build and create together!

Lesson Learned: *This activity promotes play thereby contributing to early literacy development*

by increasing attention span, memory, creativity, and language and vocabulary skills. It also lays the foundation for logical mathematical thinking, scientific reasoning, and problem solving.

Move Like A Robot

LEGO Smart Creativity Contest Entry

By Kathleen Taylor, Hayhurst

We blindfold a team member and the other person on the team has to move their partner through a hallway and in and out of obstacles by giving commands to them. Then we switch so each partner gets a chance. After this we send them to use their robots and teach them to give simple commands to work the robots. We put a square track down on the floor and have each team get their robot to follow the square. They use their rotations and their turns by degrees.

Lesson Learned: *Students will understand how the robot need commands to tell it to go right, left, forward or backward.*

Build a California Mission

LEGO Smart Creativity Contest Entry

By Darcy DuGal, Anza Elementary School

Students will study the general architectural design of the California Mission system. They will identify key differences in the styles of the missions. Student teams will then build models of a mission of choice. They will create a replica of the facade of the mission using their LEGO bricks. This lesson follows California 4th grade curriculum standards.

Lesson Learned: *Student teams will study the architectural design of the main California Missions. They will replicate the general design features of the mission of choice using LEGO bricks. They will develop their teamwork skills and the ability to transfer new learning.*

Paper Making Machine

LEGO Smart Creativity Contest Entry

By Conrad Herrman, Calvert School Home school

By asking Conrad to simply build anything he wanted to, I learned that imagination could lead a 5 year old to an engineering project. So, I would recommend asking students to build any type of machine that they could think of, and then allow time for each student to explain exactly how his or her machine works. I had so much fun listening to Conrad's intricate explanation of how this machine processes wood into paper!! I especially enjoyed hearing how the eyeball functions to ensure that the paper is made correctly before it gets sold. For a 5 year old, the benefit of having them build some type of machine is that it leads them into explaining how something processes and functions step-by-step, while also providing them an opportunity to use their imaginations and communication skills to vividly explain how something works.

Lesson Learned: *I home school my son Conrad who is 5 years old and loves to be as creative as his imagination can take him (which is far!). From this activity, he learned to freely build whatever his mind thought of as well as improve his hand-eye coordination. He also demonstrated his ability to explain how his machine works in sequential steps. My instructions to him were to build anything he wanted using only the LEGO Smart Kit. Within a couple minutes, he handed me what he called "a machine that makes paper out of trees". He gave me intricate instructions as to where the wood goes in, gets processed, and then comes out as*

paper so that "they can then take it to the store and sell it". The eyeball serves as the "checker" to make sure the paper is ready (quality control!).

Communicating Through LEGO

LEGO Smart Creativity Contest Entry

By James Norman, Thurgood Marshall

1. Students will pick a partner. 2. Each Student will be given ten LEGO bricks. The 10 bricks will be of various shapes and sizes. But, each partner will have the exact same set. 3. Students will sit on the floor with their backs leaning against each other. 4. One of the students will create an object using all 10 LEGO bricks. The other student does not look at the object. 5. Once finished, the student that created the object will direct the other student to create the same object using the bricks he or she has been given. 6. The directing student can use only verbal instructions to assist the partner. 7. Once the students feel confident that they have completed the activity they are allowed to compare their objects. 8. Students would discuss what went well and what didn't work well. 9. Students would then switch rolls and try again. Repeating the steps. 10. In the end students would come together as a class and have a discussion about communication. 11. Students would then be asked to write a reflection about the exercise or they could write about a time when verbal communication was/is important to their lives.

Lesson Learned: *Students will learn to communicate in an effective and positive way. Plus, they will strengthen their team building, verbal communication, and fine motor skills.*

Geography: States

LEGO Smart Creativity Contest Entry

By Jessica Sattani

1. Have students go on the computer or use library book to research at least 3 facts about a state of their choice. 2. Have students make the state from LEGO bricks and the three facts they found out about. 3. Students will present their states to the class. 4. Each student will display their state during a unit on geography.

Lesson Learned: *Students will use information they learn from researching about a specific state*

Trust Within

LEGO Smart Creativity Contest Entry

By Danny Morreale

Students will stand on a table and let themselves fall back wards into their partner. If their partner misses. the student will have to build a LEGO tower within 1 minute.

Lesson Learned: *Students will learn to trust their friends and neighbors.*

Constructing A Five-Paragraph Essay

LEGO Smart Creativity Contest Entry

By Andrea Corbo, Keys Gate Charter School

Each student will have five LEGO bricks and one permanent marker. Two bricks must be larger

than the other three. 1. The first brick represents the introductory paragraph. The student writes "introduction" on this first brick. 2. The second brick represents a paragraph that will support one of the three supporting details needed for the essay. The word "detail #1" is written on this brick. 3. The third brick represents the paragraph with the "detail #2". This is written with the marker. 4. The fourth brick has "detail #3" written on it. 5. The fifth, and last, brick has "Conclusion" written on. This paragraph represents the "wrap up" of all the details that have been covered in the essay.

Lesson Learned: *Language Arts: Students use LEGO bricks as a visual tool to help them construct a five-paragraph essay. Each brick represents a paragraph. I have used this activity to help my students with their state-wide writing assessment practice tests. They love it! It's hands on. I've even used it with sixth graders.*

Transportation

LEGO Smart Creativity Contest Entry

By Helen Joran, Hoover

Students were create a form of transportation. Automobile airplane, metro rail, etc. Using LEGO bricks they will create their designs for what they want to build and work together selecting and creating their final item.

Lesson Learned: *team building, sharing ideas, design skills*

Human or Animal Skeleton

LEGO Smart Creativity Contest Entry

By Laura Locke, Brighton Middle School

Teams of students work together to build a human skeleton and name the parts and their function. Try to list all the parts according to diagram provided by nurse/ health teacher. Bring to nurses clinic/health class on certain date for judging by nurse and health teacher (or possibly science classes, school staff, etc). Also, correlate lessons in classroom with nurse/health teacher so that students understand skeleton and functions of bones. Will need building blocks, diagrams, and tables for display.

Lesson Learned: *This activity would promote team building in pre-teens, health knowledge, science skills, communication, and definitely hand eye coordination. Great way to get kids talking and learning about the human skeleton and how the body works!*

LEGO Stop Motion

LEGO Smart Creativity Contest Entry

By Matt Maurin, Edison High School

Learning Objective: Students will produce a 10 second video on the topic "Good work habits in class." Hour 1: Lecture on Stop Motion with teacher example of a 5-10 shot sequence which will amount to about half a second. Students will storyboard their ideas and plan "sets" for their scenes. Begin creating sets from LEGO bricks, construction paper, colored pencils, magazines, and glue. Hour 2-4: Students will use cameras, tripods, flashlights, sets, and bricks to create stop motion scenes based on their storyboard. Hour 5-6: Editing and revision.

Lesson Learned: *PATIENCE! planning, scene composition, camera work, editing, revision Prior Knowledge: Students understand how to use a camera, tripod, and editing software.*

Building Community

LEGO Smart Creativity Contest Entry

By Donna Smith, Heard Middle School

Ultimately, field trips to actual locations in the community would accompany this project. This activity would take place on a LEGO building mat in which students must work together to build a community. The students would "read" and follow building plans from generic LEGO sets to build. Students would use the computer to search and download plans to follow- allowing their own plan. Then students would work together to sort and collect bricks required for each project. Students would complete one building activity and learn about one community service at a time.

Lesson Learned: *I would like for my students to learn community skills through building a LEGO community. They will learn about the required community services such as (post office, medical, court house, restaurants, grocery store, etc) while building.*

Wild Rollercoaster

LEGO Smart Creativity Contest Entry

By Wendy Dresser

Making your idea of a wild roller coaster you could build if you could build one how and what would you build, twist turns caves etc?

Lesson Learned: *sharing, teamwork and logic thinking*

Building Our Way To Bigger Numbers

LEGO Smart Creativity Contest Entry

By Jennifer Gleaton

(Kindergarten) Using LEGO bricks, students are shown a card with a number (1 through 20) and they stack that many bricks together. Students create stacks of 10 to count by 10s to 100. Students group the bricks by color for classification practice.

Lesson Learned: *Students learn counting sets of objects 1 - 20, creating sets of 10 to get to 100, color classification*

Sharing With Friends

LEGO Smart Creativity Contest Entry

By Jessica Ridge, WeeFriends Preschool

We have decided on building a specific building from a field trip we had. Each student will be taking turns in helping to design this building by memory. LEGO bricks will be divided equally among the students. One student will start adding a few of their bricks then will pass to another who will add a few more this will continue until all the bricks are added, and then we will determine if it turned out like we all remember seeing the building.

Lesson Learned: *Sharing, Hand Eye Coordination, Team building skills, & memory building skills.*

Sorting By Colors and Patterning

LEGO Smart Creativity Contest Entry

By Keri Nitta, Antelope Meadows Elementary School

I group the students in to 4 table groups (5-6 per group). I then review our sorting chant, "Sorting is cool. Think of a rule. Give it a name (sort by colors, shapes, size). And group them the same." I then put a pile of mixed up LEGO bricks in the center of each table and students discuss and start to sort the pile of bricks.

Lesson Learned: *Students learn about sorting and patterning at the beginning of the year. Groups of 5 or 6 work together to sort the Legos by color. They work on communication and teamwork, as well as practicing sorting and identifying color names. Students who have mastered sorting move on to building patterns, such as AB, ABB, or ABC. An extension to this activity that we will do later is graphing by color.*

Build a Building

LEGO Smart Creativity Contest Entry

By Randi Olmos, C&K PLAYLAND

We will start with building a tower or castle. Counting all the LEGO bricks used and what colors were used in the patterns. How tall the castle can go before it falls over. What knocks it down easiest and how we can build a better castle. This will teach my students problem solving with others. We would need a lot of lego pieces for us to complete the lesson plan. Fun way to learn besides books. Little ones learn better hands on.

Lesson Learned: *My students would learn how to work together and how to share with others. Hand and eye coordination is very important. Problem solving as well.*

LEGO Challenge

LEGO Smart Creativity Contest Entry

By Allen Lathrop, Home Away From Home Preschool

Children will enhance their hands on education with a project to design and build a competing model for the LEGO Challenge.

Lesson Learned: *Hand-eye coordination.*

Homework Machine

LEGO Smart Creativity Contest Entry

By Jennifer Crone, Cedar Elementary School

1. Students will read the book "The Homework Machine" in reading teams. 2. After a book discussion, students will also work cooperatively in teams to design and build their own "homework machine" from LEGO bricks. 3. Students must present their designs to the class explaining how they work.

Lesson Learned: *Students will learn a variety of skills through this lesson. They will work cooperatively with others which will improve their communication skills. This activity will also encourage creativity through imagination since there is no such thing as a "homework machine"*

encourage creativity through imagination since there is no such thing as a "homework machine", but students would definitely love it if there was such a thing!

Follow The Leader

LEGO Smart Creativity Contest Entry

By Jennifer Lee, Valley Preparatory School

Students will be paired up and each student will be given a LEGO Smart Kit. The students will sit back to back so that neither student can see the other student's bricks. Partner 1 will build a simple structure and then give Partner 2 step-by-step directions on how to build the same structure. The team will then compare their structures to see how well they were able to communicate with one another. They will then switch roles and repeat the exercise. If time permits, every student can create another simple structure and write down step-by-step directions on how it was built. Then students can exchange papers and try to follow the directions they are given.

Lesson Learned: *Students will learn the importance of being very detailed and exact when giving directions, and the importance of listening carefully when following directions.*

STEM Your Knowledge

LEGO Smart Creativity Contest Entry

By Nancy Keller, Oakdale Middle School

1. Students will obtain the problem-solving card to design the tool. 2. Students will use software to create a plan to figure out what LEGO bricks are needed to build the design. 3. Students will determine cost-effectiveness of the tool. 4. Students will evaluate the workload and/ or capacity of the project.

Lesson Learned: *Middle School students will find creative solutions in a team-based contest. Given basic knowledge, students will have to create a model of a tool that could be used to help in Biotechnology or Agriculture. Each team will design and create a "prototype" of the tool. Students will have the project judged during the Learning and Literacy Expo at school.*

Foreign Language Prepositions Have Never Been So Fun!

LEGO Smart Creativity Contest Entry

By Laurie Watson, Ross School

Students are each issued identical sets of LEGO bricks. The teacher directs the students (Entirely in Spanish or other target-language) to place the bricks exactly where she does. She might say "Place the green rectangle on top of the black rectangle." By doing this herself, as well, the children understand what is being said. Through repeated actions, building the "tower,"

becomes a means of learning all of the prepositions of place. By the end of the second class-period, students can understand and create quite complicated "towers." Once they are getting good at it, the teacher builds her tower out of their sight. They have to really understand the words to be able to build it correctly. The teacher might say: "Place the long blue rectangle on the table in front of you. Place the longest green rectangle on top of it, forming an X. Place the orange square on top of the X, in the center. Place the small pink piece to the right of the orange square, still on the green rectangle. Place the white square under the longest green

rectangle, to the left of the orange piece. Place all remaining pieces all around the tower." At this point, the teacher would reveal her "creation" to the class, and students would compare theirs to each other's and to hers. The first time the students do this, they might stumble a bit. But they SOON get very good at it, and beg for 'harder ones.' The number of combinations and permutations is endless! This activity really keeps the kids involved! It addresses the needs of kinesthetic learners as well as those with highly visual/spacial intelligences. It can be used with primary-grades children through adult learners! Once students have learned these words, this activity can be pulled out just for fun and re-enforcement any old time. To switch things up, students can do this in pairs or small groups, one giving the directions and the other(s) creating the towers while the teacher circulates to assess understanding. The building of a tower can even be an assessment in itself. Prepositions have never been so fun!

Lesson Learned: *Students learn the Spanish words for the "prepositions of place:" next to, on top of, under, to the right of, to the left of, all around, between, inside, outside, far from, close to, etc. They also review the words for colors, shapes, and sizes. More importantly, they learn that learning can be very fun!*

Three Dimensional Figures

LEGO Smart Creativity Contest Entry

By Cheryl Pepler, Palmer Elementary

Using 3x5 cards write the name of a 3 dimensional figure (i.e. cube, rectangular prism, square prism). Mix these cards up and place them in an open container. Divide the class into pairs. Give each pair a LEGO Smart Kit. Have one student select a card from the open container. Students have 30 minutes to create the figure they picked. At the end of the appointed time, have the class as a whole judge each creation determining if what was created is correct. If not, students are to determine what needs to be corrected or if more blocks were needed.

Lesson Learned: *Geometry, 3D figure identification, team building skills*

Rembrandt Light

LEGO Smart Creativity Contest Entry

By Joseph Goodyear, Home school

1.Study paintings by Rembrandt and take notice of his use of "light" to highlight areas of his paintings and how he uses it to lead a viewer's eye. 2.Have students create an original sculpture using LEGO bricks. 3.Next have students shine flashlights at different angles as they move around their sculptures to see how the light changes the appearance of their sculptures. 4.The students can put their sculptures on a piece of white paper or dark paper and then shine the light at different angles again and notice the appearance changes. Then turn out the lights and use the flashlights to illuminate the sculptures. 5.After observing all the different effects of the light on their sculptures have the students use colored pencils, crayons, or paint to sketch what their sculpture looks like when highlighted by the light. See if they can capture or use some of the same techniques Rembrandt would have used to "illuminate" the subjects in his works. 6.Each student can then show their original sculpture in regular light and their sketch and talk about the techniques they used to illustrate the light in their sketch.

Lesson Learned: *Art history, sculpture, use of light to highlight a subject, shading and contrast*

Ready, Set, Go!

LEGO Smart Creativity Contest Entry

By Stacy Lee, Mr. Woogs Learning Center

Put equal amounts of different sized LEGO bricks in a bag, enough for four to five children to have at least ten pieces. Dump the bricks on the table and tell each child to choose a size, color or shape and create something using only bricks of the size they chose. Tell them they have ten minutes to complete this task.

Lesson Learned: *Children will learn shapes and sizes, colors sorting and fine motor skills.*

Unique People

LEGO Smart Creativity Contest Entry

By Natalie Kroope, Northampton High School

Each student will be given an identical set of LEGO bricks from the LEGO Smart Kit. Students are instructed to position their desks in a circle (outward facing) to not be able to see each others' work. Students are instructed to create a "person" using any of the LEGO bricks provided--although they do not have to use all of the LEGO bricks. When they complete their project, they are to place their remaining bricks inside their bag, and only have their "person" on their desk. When every student completes their "person" construction, all students will turn their desks inwards (so everyone can see each other). Then, students are instructed to walk around the circle to look at what every student constructed with the same LEGO bricks. After all students make their way back to their desks, they should sit down in their seats. The teacher will facilitate a group discussion. Questions that might be asked include: 1. What were your initial reaction to the directions of this activity? 2. What were your strengths and struggles with this activity? 3. What were your thoughts when you were walking around the circle to see the "person" construction of your classmates? 4. Was there a particular "person" you thought was the most unique / creative--and why? Students should be debriefed about how every person is different and unique in their own particular way and we should praise these differences (instead of putting them down).

Lesson Learned: *Students will learn basic principles of diversity and individual uniqueness. This activity could be used during our district's newly created required ninth-grade course called Peer Relations. This class teaches students about anti-bullying concepts--including genuineness, attentiveness, and empathy.*

Free Choice

LEGO Smart Creativity Contest Entry

By Katie Hillison, First Baptist Church CDC

Each student was given a LEGO Smart Kit and told to build something with the pieces individually. They came up with a spaceship, a boat and a race car to name a few.

Lesson Learned: *Creativity, imagination, colors, hand-eye, self-help, cause and effect, and last but not least self-esteem. They were all so proud of their accomplishments.*

Largest Square or Rectangle

LEGO Smart Creativity Contest Entry

By Theresa Rakov, Rakov Academy

Ask each student to build the largest square or rectangle they could make using the LEGO Smart

Ask each student to build the largest square or rectangle they could make using the LEGO Smart Kit. The largest square created was 10 x 10 and the largest rectangle was 11 x 12. We ended up with 3 pieces that did not make it into the rectangle.

Lesson Learned: *Learn the difference between a square and a rectangle. Using the LEGO bricks to build the largest one they can in 5 minutes.*

Kindergarten

LEGO Smart Creativity Contest Entry

By Rae Lyn Duke, Cox-Donahey Elementary School

Use the LEGO Smart Kit to teach colors, basic number counting, and number value. Use the kits to teach shapes and then sizes.(Big, Bigger, Biggest) Another activity would be for the teacher to build a building/shape...the students would analyze how to make that shape, then they would create the same shape. As the school year advance, so would students' visual skills. Mid-April or May invite the childrens' families to come into the classroom and use the kits as a fun activity. Have complex pictures enlarged. (Something that a student built during our class time) Then let the student show off and make that structure. Next host a free style building time. This is where the kindergarten student and their family makes a structure that must stand up on it's own and who's structure is the tallest wins! A Teacher made LEGO award.

Lesson Learned: *Many of my students in my kindergarten don't attend preschool. Over half of the children are from low, low income families. When they come to my classroom and use my DUPLO bricks for the first time I always here "Hey,they stick together." This not only teaches the children to share, cooperate, invent new shapes, fantasize about their building,they must evaluate if the building is going to fall, then adjust for that problem. Next they compare what they have build to a given picture, they predict how many bricks it will take to complete their structure, now working in a team they will persist on their way, they will team work and learn how to work in a group. Their hand-eye coordination will improve. Working with the blocks will stimulate their visual growth and lead them to question if what they are doing is what the teacher requested. The skill I like best is ...Thinking! Critical thinking is developed using the Duplos because the child is now creating and following a thought process that will lead them to a finished product. That is what learning is all about.*

Mini Masterpieces

LEGO Smart Creativity Contest Entry

By Maureen Foelkl, Chapman Hill Elementary

Artist Research: Have the students research an artist. You may direct them to a time era or an artist that used printmaking as an art form. Students will write important facts about the artist

in a miniature book that will be placed with their display. Printmaking Activity: Printmaking is one of the original technologies. Provide students with a tag board weight 4x4 piece of paper. Have the students paint just the top (dots) of their LEGO bricks. Using printmaking techniques the students will make the LEGO pattern to fit in with an artist style of art production. S/he will then paint or use construction paper cut outs to finish the piece. Science: As the prints dry students will create a balanced scaffold to hold their masterpiece using only the LEGO Smart Kits. With the remaining bricks the students will use their engineering skills to create something that ties into their display. They must use all the pieces from the kit. A photo is worth a thousand words. Please visit <http://chapmanhill.salkeiz.k12.or.us/new.htm> to view a photo of a finished project. This is an activity that can be used as a speaking task and/or as a display for a

school wide event.

Lesson Learned: Art: Printmaking using reverse engineering skills. Students will gain knowledge in the value of printmaking and learn how it applies to other subject areas. Mathematics: Students will learn investigations in math using prints from their selected artist. They will investigate symmetry, shapes, patterns and angles. Language Arts: Researching an artist such as Rembrandt, Goya, Degas, Picasso, Escher or Warhol for writing a biography. Science: The students will create a balanced scaffold using their engineering inquiry skills using LEGO bricks.

How Much Math is in This LEGO Brick?

LEGO Smart Creativity Contest Entry

By Holly Doe, Pelham Elementary School

1. Place the 4 x 4 LEGO plate from the LEGO Smart Kit under a document camera so the entire class can view it. If you do not have access to a document camera you could also have each student hold a 4x4 plate in their hands or take a digital picture of the image, upload it to the computer and project it using a projection device. 2. Start by having students make mathematical observations about the 4x4 plate displayed. How many studs are on the brick? How many ways can we represent the number 16? Record student observations as they are shared on the computer or on a whiteboard. Some possibilities might include 16, 4+4+4+4, 4 x 4, shape is a square, Area=16, $2 \times 2 = 1/4$ of the brick, $2 \times 4 = 1/2$ of the brick, Two 2x4 bricks=One 4x4 brick, etc. 3. Once the class has generated many possibilities, pass out the kits to each group of 2-3 students and ask them to generate observation lists for at least three of the bricks in the kit. Give students a recording sheet where they can draw a representation of their brick in the left-hand column and record their observations in the right-hand column. Encourage groups to look for ways to represent the brick not already discovered by the whole class. 4. Next, have the small groups connect several bricks to a baseplate to create other geometric shapes and record new observation lists about the newly created larger shapes. 5. Come back together as a whole class to share new student observations and creations. Pose additional questions to broaden students thinking about the math possibilities in LEGO bricks. How many shapes were created? Did anyone look at the bottom of a brick? There is math there too! How many plates does it take to make a brick of the same shape? *This activity is designed for grades 3-5 mathematics. This would be a great activity to begin work in mathematics with LEGO bricks. Each area of math (perimeter, area, fractions, etc) can be delved into much deeper after this lesson.

Lesson Learned: Students will learn that there are multiple ways of looking at a problem. Other math topics include number sense, math facts, geometry, and fractions.

Break-Aparts

LEGO Smart Creativity Contest Entry

By Susan Latino, Durant Road Elementary

Give the students a LEGO Smart Kit. They will build a tower. Ask them to break apart the bricks to show what embedded numbers are in their tower. Example: 1. Give each child 8 bricks to build their tower. 2. Let them break them apart: i.e. 1 & 7. 3. Give the number partners for the 8 tower. i.e. $1 + 7$ 3. Give the number partners for the 8 tower. i.e. $1 + 7$

Lesson Learned: The children will learn about the embedded numbers that are within a number by using LEGO bricks.

Lengthy LEGO

LEGO Smart Creativity Contest Entry

By Cindy Skeen, Trinity Christian School

Students will be paired up and given one LEGO Smart Kit. Starting with the gray brick, students will be asked to find other combinations of bricks that can equal the length of the gray brick (for example, a rectangular orange and a square yellow). Partners will take turns manipulating the bricks and recording the results. The experiment can be repeated with other bricks as the main length. Other variations of the activity could include placing bricks on top of other ones to match area (for example, with a light green square on the bottom, place a square white, a rectangular yellow and a rectangular red on top to match the area of the green square).

Lesson Learned: *Students will learn that several objects put together can equal the length of another object. Students will work together in pairs to discover possible combinations. Hand-eye coordination will be strengthened by manipulating the LEGO bricks.*

Florida Architects: Recreating Historical Moments in Florida

LEGO Smart Creativity Contest Entry

By Lisabeth (Betsy) Brown, Azalea Park Elementary School

Students will choose a specific period of Florida history. After researching the choice of event, students will use photographs, drawings, or blueprints, if available, to recreate the monument associated with the historical event. If no monument has been created, students will create their own version which would show the importance of the event for history.

Lesson Learned: *Students will work in groups of four to research events in Florida's history. Through team cooperation and development of team skills, students will choose specific areas of concentration of each event. Teams will build a model of a specific monument or will create a monument that depicts the historical event. Students will use math skills to build monuments to scale. Teams will work together to compose an oral presentation of historical events surrounding the monument.*

Technical Writing Practice with LEGO Bricks

LEGO Smart Creativity Contest Entry

By Kimberly Hinton-Gannon, Meadow Park Middle School Beaverton School District

Materials Needed: 1) 5-10 Manuals from assemble-it-yourself furniture kits for demonstration and instructions. 2) File folders for building privacy screens. 3) 2 LEGO Smart Kits for each student in class. 4) Paper and writing utensil. Teacher will hold up manuals from different sources and explain how they are used to help people build the items they purchased. Teacher will explain that the students are to work in pairs. They are to face their partners, but put up a privacy screen so that they cannot see what their partner is doing and visa-versa. Teacher will explain that they are to put together an "invention" with the LEGO bricks. They will then explain that once they build their invention, they are to write in words only, the exact directions to build the invention. The instructions should title the invention, give the purpose of the invention, and then give detailed instructions on how to build the invention. No pictures should be drawn. After they have finished, partners will trade directions and each will attempt to build the invention of

the other. Once they have both built the inventions, they will remove the privacy screen and check the new inventions against the originals. If they are different, students should dialog about where the confusion occurred. Teacher should then ask for a volunteer to share their directions and attempt to assemble the invention from that student's directions. If there is confusion, the teacher should discuss how things could have been clearer.

Lesson Learned: *Students will learn to write detailed instructions to build their own LEGO designs. Students will learn to read and follow instructions to demonstrate clarity of the writing.*

Build A Community

LEGO Smart Creativity Contest Entry

By Linda Nagy, Holy Name Elementary School

1. Student teams plan (make a blueprint-like drawing of their assigned community -- urban, suburban, or rural). A. Consider resources available. B. Group discussion. C. Decision of plan, keeping in mind that 2. Assemble planned community. 3. Assess finished products. Make revisions, if warranted. 4. Share results with other students.

Lesson Learned: *Planning, team cooperation, characteristics of different communities (rural, urban, suburban), spatial concepts, measuring, responsible use of resources, time management*

Leonardo De-Invent-U

LEGO Smart Creativity Contest Entry

By Beth Franklin, Imagine School Town Center

While studying the inventions of Leonardo da Vinci: •Give each student a LEGO Smart Kit. •Student to create something using daVinci as inspiration. •Students present their inventions. Next activity would involve groups of 4 students: •Combine the 4 Smart Kits as a group. •Brainstorm ideas with drawings, as daVinci. •Create a project and present as a group. Last activity would group students according to daVinci interest - engineering, machines, earth, health, architecture, science, and more. •Combine the Smart Kits as a group. •Brainstorm ideas with drawings, as daVinci. •Create a project and present as a group.

Lesson Learned: *The students will learn research skills through their investigations, cooperation through group activities, hand to eye coordination through construction, and oral presentation skills through individual and group presentations*

Multiplication

LEGO Smart Creativity Contest Entry

By CJ Landolt

Separate out the LEGO bricks of the same height and choose one group. Measure height of one brick. Students build any structure they choose, count how many bricks high it is and estimate the measured height. Repeat as time allows, making chart of results. Look for rule. Show $(\text{number of bricks}) \times (\text{height of one brick}) = (\text{total height})$ for basic. For more advanced students, discuss how nesting affects the height and equation: $(\text{number of bricks}) \times (\text{base height of one brick}) + (\text{height of knob}) = (\text{total height})$

Lesson Learned: *Connection between visual and symbolic representations of multiplication and measuring practice.*

Whatever Floats Your Boat

LEGO Smart Creativity Contest Entry

By Ande Wright, Graham Junior High

Working with a partner, use all of the pieces to build a boat that will float in water and will hold the most paper clips without sinking. Remind students of the time so they can test their boats and make revisions within the 5 minute time limit. When finished, discuss what changes could have been made and why work under a timed schedule.

Lesson Learned: *Models need to be tested, refined, and redesigned. It is a necessary skill to be able to change an idea or model in order to make it work.*

Architectural Awareness

LEGO Smart Creativity Contest Entry

By Christine Aloï, vestal middle school

To redesign/reuse an existing piece or architecture in our community and make it into something useful to the community. Students will reconstruct a model of the architecture using LEGO bricks. They will learn steps to make it "green", help the environment and help the community. They will present their project in January At BAE systems along with other schools in the community.

Lesson Learned: *team building, research skill, math, blue print reading, physics, public speaking, computer technology and sculpting in 3D.*

Greatest Surface Area

LEGO Smart Creativity Contest Entry

By Betty Chen, Chen Home School

Each child receives the same number of identically sized LEGO bricks. The goal is to make it into a polygon with the greatest perimeter. The polygon must be able to be lifted up, so the pieces must be interlocking. Once student has made the shape, s/he counts up the number of studs sticking out on the outer edge. For higher grades, the student should also determine the amount of surface area enclosed by the polygon by counting how many knobs would fit in the enclosed area.

Lesson Learned: *Students will learn how to determine the perimeter of a geometric shape and calculate the area within. Hand-eye coordination in manipulating pieces and if you split into groups, group dynamics as well as communication skills amongst team members.*

LEGO Odd and Even

LEGO Smart Creativity Contest Entry

By Marcy Savoie, Cassens Elementary School

Working in teams students with disabilities will construct numbers from 0-9 from their LEGO bricks. One team will build the number. The other team will say what the number is, and then with the remaining bricks count out that number. (example: if the first team makes a number 4, the other team will count out 4 bricks). The counting team will then group the bricks counted in twos and any remainder to help them figure out if the number is odd or even. This lesson will

twos and any remainder to help them figure out if the number is odd or even. This lesson will help to improve manual dexterity in students who have physical disabilities. Team building will help students with social skills. Counting out bricks and grouping them in twos will help students visualize the concept of odd or even which is sometimes hard to understand, especially among students with disabilities.

Lesson Learned: *Students with disabilities will improve their physical, social and intellectual learning while constructing numbers from LEGO bricks and then counting out bricks to demonstrate the concepts of odd and even. Students often learn better while using hands-on materials such as LEGO bricks, and undoubtedly they will have a lot more fun!!*

Imagine That

LEGO Smart Creativity Contest Entry

By Lauren Babcock, Asbury School

This activity works best for small groups of 6-10. The students will be divided up into two groups and separated on opposite sides of the room (preferably with a divider to hide their creations from the other group). Students will then be instructed to create a place that represents a calming, safe place to them. This can be somewhere they have been to before, or a place of imagination. (Examples might be given if needed: the beach, your bedroom, the mountains, etc.) Each group will then be given their LEGO Smart Kit. Groups will be given 15-20 minutes to complete their agreed-upon safe place within their group. After they are done, each group will select one member to act as a representative for the group. That person will be allowed to go to the other group's LEGO creation and view it without speaking to the other group. The representatives may then go back to their respective groups and discuss what they saw and what they believe it is. Each group must come up with three reasons as to why the other group chose the safe place they did. This will require them to step outside of themselves and put themselves in another's point of view. After 5 minutes of in-group discussion, each group must present their reasons to everyone else. All students will listen, and then additional input on these safe places can be added as explanation at the end. The instructor will then talk about the importance of having a safe place, as it can be a place that one can go to physically to calm him or herself down, or a place one can imagine in his or her mind to help reduce stress. The LEGO creations will be left in the classroom to refer to again later that week as a real representation of everyone's "safe place."

Lesson Learned: *Students will build upon communication skills, anger management skills, hand-eye coordination, teamwork, creativity, and empathy.*

Cooperative Building

LEGO Smart Creativity Contest Entry

By Lisa Daggart

Teacher/facilitator will build a model using only the bricks provided in the kit. This kit will be the model structure. The students will be broken up into teams of three. Each team will be given a set of the same bricks. The team of three will be broken up into three jobs: The spy, the communicator, and the replicator. After the rules are discussed (only words are spoken and no gesturing, etc.), the spy will look at the model (which is hidden from view from anyone who is not a spy) and then walk to where the communicator/spy conference area is. The

communicator will listen to the spy's description and then will walk to the replicator and tell the replicator how to reconstruct the structure. It is important that the spy never is able to see the reconstructed structure, so can not correct what is not placed correctly. The first team to

accurately reconstruct the structure wins. The teacher/facilitator should then lead a discussion in what language was helpful and how they can communicate more clearly.

Lesson Learned: *The students will learn to communicate clearly and efficiently to build a structure identical to a model structure using only words.*

Cubes and Rectangular Solids

LEGO Smart Creativity Contest Entry

By Frank Egan, Egan Academy

#1 - create a 3D cube - all sides must be equal #2 - create a 3D rectangular solid - sides must be regular and symmetric For each answer: What is the largest you can make? What is the smallest you can make? Use LxWxH to determine volume for each.

Lesson Learned: *3D spatial relationships, volume, measurement, symmetry*

Brick Buddies

LEGO Smart Creativity Contest Entry

By Judy Leddy, Durham Elementary School

This is a get-to-know-you game that any elementary grade level can play with their peers at the beginning of the year. Tell students that they are playing the Brick Buddy Game to find out more about their classmates as we start the year. Hold up one brick and tell students when they pull out a certain color brick, they will share that trait about themselves. For example, if you pull the red brick, you share a trait about your family such as how many brothers and sisters you have. The teacher can show the color of bricks on a chart with the traits. Put the LEGO Smart bricks in a bag and shake them up. One student pulls a brick and shares a trait. The bag goes around the room several times and if a student pulls the same color, they may choose another one to share. When all students have shared several times, the class can build something out of all the bricks as a reminder of all the traits the students share in the class this year. Red Brick= family Green Bricks= future goals Yellow Brick= a significant moment in your life Blue Brick= a gripe or problem you have Black Brick= something you have in common with another member in the class Orange Brick= a favorite food Pink Brick= a famous person you like Gray Bricks= a hobby or interest White Brick= favorite TV show Yellow Eye Brick= free choice

Lesson Learned: *We are a diverse class, yet we have many commonalities and we will build on those to form a community of learners during the year.*

House

LEGO Smart Creativity Contest Entry

By Feross Hawatmeh

Needed is white LEGO bricks for walls such as the bone. And black bricks for support beams. Floor is green for the green parts of us

Lesson Learned: *How to support the house and how the support is like the bones in our bodies to keep us up and strong.*

Using LEGO Bricks To Model The Surface Area

Using LEGO Bricks To Model The Surface Area

LEGO Smart Creativity Contest Entry

By Denise Thompson, Orting High School

Step 1: Have students construct a 4 X 6 table and label the columns "diagram, surface area, volume, SA/V ratio". Step 2: Using a single LEGO brick, model for students how to measure and calculate the surface area and the volume. (This step may or may not be recorded as data) Step 3: Have students select a different sized brick and draw a diagram of the brick in the first box. Repeat step 2, recording their data in the appropriate boxes on the table. Step 4: Calculate the SA/V ratio by dividing the surface area by the volume and record in the last column on the table. Step 5: Students should repeat steps 3 and 4 picking a different sized or shaped bricks each time until they have tested 5 different LEGO bricks. More advanced students can combine bricks to make more complexly shaped cells. Step 6: Students should discuss what patterns they see to the data. You may have students graph their data to answer these questions: What happens to the volume as the surface area increases? What happens to the SA/V ratio as the surface area increases? Which "cell" would be most successful at surviving?

Lesson Learned: *Students practice calculating the surface area and volume of a cube.*

Students learn the relationship between surface area and volume as they design and measure lego "cells". Students discover why cells are usually very small.

Zoology Fun

LEGO Smart Creativity Contest Entry

By D. Landsverk

For zoology, one student uses the LEGO bricks to build an animal. Another student has to play "20 questions" using zoology vocabulary to figure out the animal.

Lesson Learned: *listening skills, creativity, communication, vocabulary review*

LEGO-Metrics

LEGO Smart Creativity Contest Entry

By Teri Valdes, Valley Middle School

1. Partners will be given 10 LEGO bricks, graph paper, a metric ruler. 2. Students will work together to measure the different combinations they can make with the brick, measure and convert cm to mm, draw on their paper there renderings. 3. The students with the most combinations and correct answers will get a homework pass.

Lesson Learned: *Students will work with a partner to measure LEGO bricks in millimeters and centimeters. They will be asked make different combinations, draw on graph paper there bricks, be able to convert from cm to mm.*

Finding Shapes

LEGO Smart Creativity Contest Entry

By Deborah Agerton, Bay Minette Intermediate School

Line up each LEGO brick by: length, shape, thin, thick

Lesson Learned: *thin,thick, long, short, etc.*

Build It. Draw It.

LEGO Smart Creativity Contest Entry

By Sharon Wilson, River Mill Academy

Our school is a K-12 Charter school and I am the Art Teacher for all grade levels. I plan to utilize the LEGO Smart Kit as a building experience for my 3rd grade art students. They will

construct "Brick Creations". The next process is to have my Art1 students use two 90 minute block classes to study Perspective Drawing using the Brick Creations as their subject matter. The high school students will develop giant perspective drawings in ink or charcoal with light and shadow to illustrate the LEGO forms. Drawings and Brick Creations will be displayed in an art show.

Lesson Learned: *Cross Curriculum education activity. Team building, Manipulation of fine motor skills and hand eye coordination and school unity.*

ABC Orders

LEGO Smart Creativity Contest Entry

By Julia Ritterbusch, ESL, Washington County, VA

Have students divide LEGO bricks by color. Have students name the colors orally, as you write them on the board. Have students copy the words onto index cards (one color per card). Students will alphabetize the bricks by color, and lay them left-right, using the index cards to help if needed. Extension: Have students build something w/ all or part of their bricks; compare & contrast their creations using the color words.

Lesson Learned: *Color words, alphabetizing, reading left-to-right*

Pre-Algebra Blocks

LEGO Smart Creativity Contest Entry

By Julia Ritterbusch, EB Stanley Middle School

This activity focuses on the circles (bumps) on the top of the bricks. Have students group bricks by the # of circles they have. Ask, if $x=1$, which brick would be called "x"? (pink one). Which bricks could be called "x" if $x=2$? (small 1x2 green & yellow) Once students grasp this, have them find a brick that shows "2x" if $x=4$ (answer: a 2x4), or 4x (answer: the 2x8 or 4x4 brick) Continue, making the problems progressively more thought-provoking. Once students are comfortable, divide into teams. When they answer correctly, have them use their correct answer bricks to build a tower. Tallest tower wins!

Lesson Learned: *Concrete understanding of an abstract concept.*

LEGO Vinn Diagrams

LEGO Smart Creativity Contest Entry

By Crystal Miller, Milton Somers Middle School

(5 minutes) Engage: Create a Vinn diagram using favorite flavors of ice cream. Because some students like more than one flavor, they will say that they have two (or more) favorite flavors. Use basic flavors (i.e., chocolate, vanilla, strawberry) to make this task quick and engaging. (10 minutes) Explore: Create a Vinn diagram using as many of the LEGO bricks as possible. Allow

minutes) Explore: Create a Venn diagram using as many of the LEGO bricks as possible. Allow each student to create his or her own paper. Have students draw the circles on the paper. Also, have students write the labels in each circle. Have students write why they placed each piece where they did. For example, if they classified by color, then maybe the yellow-green piece is in the crossover of the yellow and green circles because the piece is a little bit yellow and a little bit green. (10 minutes) Explain: Allow students to share their Venn diagrams with the class. Have students walk around (gallery-walk) in order to see all Venn diagrams. Have some students explain out loud to the class so that other students understand why the Venn diagrams look like they do. (10 minutes) Elaborate: Discuss similarities and differences between each others Venn diagrams. (10 minutes) Evaluate: Using the LEGO bricks again, have students create another Venn diagram that is different than the ones they already made. Have them draw the circles and label the circles. Option 1: Have students draw and color each piece placed in each circle. Option 2: Take a picture of each students' Venn diagram. Collect and grade pictures based upon successfulness with the Venn diagram. Does the student have circles? Does the student have labels? Does the student have a logical rationale for the classification?

Lesson Learned: *Students will learn how to use a Venn diagram in order to classify objects. Students will compare Venn diagrams with each other in order to notice similarities and differences between others' perceptions of classification.*

I Spy

LEGO Smart Creativity Contest Entry

By April Sneed, The Knowledge House

We each took turns "spying" something in the room. Then we had to use the LEGO bricks provided to build that object. After it was complete those of us who did not build had to guess what it was based on what it looked like. If we could not get it, the builder then started to explain things about his "creation" to help us determine what he had "spied".

Lesson Learned: *We talked about communicating with each other, using hand-eye coordination and building skills.*

Number and Letter Drill

LEGO Smart Creativity Contest Entry

By Rachel Evett, St. John's Evangelical Church School

Decide if you want to work on number or letter recognition. Divide class into groups of 2 or 3. Explain to students they will have 3 minutes to make as many letters or numbers with the blocks provided as possible. The other members of the team are to record what numbers or letters were made. When the time is up the next student can give it a try. If you want to make it more difficult don't allow them to use the same letters or numbers as the person before. Otherwise this could be it's own logic lesson - Why did student #2 make more faster?

Lesson Learned: *Hand-eye coordination, logic / reasoning, alphabet and number recognition*

Letter Creations

LEGO Smart Creativity Contest Entry

By Abby Slentz, Home schooler

Every letter of the alphabet (upper and lowercase) can be made with LEGO bricks. Using teams, one team makes letters (or words, depending on their level) and the other team identifies them.

Vowel Smash!

LEGO Smart Creativity Contest Entry

By Vale Stradley, home school

Have the child create a play dough red carpet for our "stars" as they arrive at paradise(5 min). Ask each child who has their own activity set to then construct the vowels one at a time. This should be done with the students in the class working on the same vowel at a time. The teacher can offer as detailed directions as are necessary for the students to have success while really spicing up the "red carpet" vowel's arrival. Instruct that it should be done with the studs on the bricks pointing down and brace pieces installed between the vowel parts of a letter so it may be picked up. Each student is then instructed to place the "star" vowel in the play dough leaving it's imprint. The student is to continue doing this for all the vowels. Follow up with a V.I.P. after party with cookies and punch sharing lots of praise about each "star" vowel's performance achievements! Our vowels are truly to be celebrated!

Lesson Learned: In this activity the vowels take the main stage in a play dough "red carpet event" in which construction, imagination, and play meld into one. The vowels are reinforced and "set" in the mind of the child and the play dough as they learn to follow directions and about spacial awareness.

See-Saw

LEGO Smart Creativity Contest Entry

By Abby Slentz, Home schooler

Build a see-saw with a small base, that has same size pieces on each side that extend out but will remain balanced when upright. Try to extend sides as far a possible while maintaining balance.

Lesson Learned: Symmetry, patterns, balance.

LEGO Community

LEGO Smart Creativity Contest Entry

By Brenda Corpus, Mt. Auburn

The students will tour the outside surroundings of the school to observe what kind of places make up their community. Then students will be divided into small groups. Each group will get LEGO bricks which they will use to create important places that make up their community, such as a church, fire station, restaurants etc. They will use the bricks to build and represent the places they choose. Each group will pick three buildings in their community. Then they will give a small presentation of their final product. The students will inform why they think that their three places they chose are important to our community. Also they will explain how that building contributes to our community.

Lesson Learned: Students will learn higher order thinking skills, team building skills and hand eye coordination. They will also learn communication, organization and presentation skills.

LEGO Letters

LEGO Smart Creativity Contest Entry

By Anna Liao, CHEP North

Using a baseplate, students build a letter of the alphabet from LEGO bricks. For instructors using a letter of the week approach, you can have students build the letter of the week onto the baseplate. Then students build another object that begins with the letter that they just built. For example, for the letter P, they can build a plane, a penguin, a picnic table. Students can then share their creations with the class. Instructors can also have students count up the number of bricks used to build their letter.

Lesson Learned: Students develop fine motor, phonics and vocabulary skills.

Teamwork

LEGO Smart Creativity Contest Entry

By Dana Scott, Orange County Public Schools

Students are divided into groups of 3-4. Each group is given 30 LEGO bricks in a zipper storage bag. 1. Tell the groups a story of traveling by boat across the ocean. (Add details as necessary). The boat hits a bed of rocks on an island and is in many pieces. Everyone survived, but any electronics that were on board did not. The passengers are all stranded on the island. 2. Talk about the conditions and habitats of the island. Ask students what animals may be there, what weather conditions are present in the day and night times. Also discuss what foods may be available on the island and how to get, prepare and store these food items. 3. Tell students that they are to build a shelter to help them survive until they are rescued, using the pieces of the boat, which are the LEGO bricks. Tell students they will have 15 minutes to build their shelter. Then they will explain how their shelter works to help them survive in the given conditions. 4. Ask students to raise the hand that they write with. Tell students that there is one small problem, they broke that hand in the boat crash, so they cannot use it. They must put that hand/ arm behind their back. 5. Tell students they may begin. They have 15 minutes to build their shelter, using only 1 hand. This will require the students to communicate and work together to put the pieces together and even open the zipper top storage bag. 6. After 15 minutes is up, have one person in each group describe their shelter and how it addresses the conditions discussed earlier. Allow questions from other groups if desired.

Lesson Learned: Students will demonstrate teamwork, problem solving, communication and cooperation skills.

LEGO My Music- Rythm Study

LEGO Smart Creativity Contest Entry (SEPTEMBER WINNER!)

By Paula Augustine, Home school mom and private music instructor

Steps: 1. Give each group of 2-3 students a LEGO Smart Kit. 2. Give them 3-5 minutes to work together and line up their bricks into a rhythm composition. 3. Let each group share their rhythm composition and explain what each brick 'symbol' meant. They will need to work together to decide how to organize the bricks into length is to be played and be able to play it together when finished. I had one group use some colors as rests! Another group used dotted rhythm patterns.

Lesson Learned: The students learned to work together, work creatively, and how use symbols to communicate with the class.

LEGO Animals

LEGO Smart Creativity Contest Entry

By Calah Carmichael, Webster Elementary

To make the chart you use pictures of each LEGO brick and then put a value next to the brick. For example, a red brick with 4 studs on top is worth 5. Post the chart in a visible area.

Lesson Learned: *I do a really neat activity with my students using LEGO bricks. First I write a number on the board. I made up a chart that tells the students each brick is worth a certain amount. The students have to use their bricks to make something unique using elements but not going over the amount specified. They absolutely love this! I do this activity as a class starter for my 2nd grade kids.*

Isometric Concepts

LEGO Smart Creativity Contest Entry

By Andy Owens, Saint Stephens High School

This is a Drafting I class, which is a intro class. Students are learning the concepts of pictorial sketching. I have found if you give them an object they can learn better by seeing it. The students are instructed to come up with an idea of a structure from a random set of LEGO bricks that are in their bag. They are to sketch their idea and then see if they can build it from their sketch.

Lesson Learned: *Students are given a zip lock bag of random size LEGO bricks. They are to brainstorm ideas of the a structures, then sketch one of them. Then build it from their bricks.*

Models of Acids and Bases

LEGO Smart Creativity Contest Entry

By Jody Cleveland, Home School

1. Hand out several LEGO square bricks and black LEGO beams with the following guide: Orange bricks represent Hydrogen atoms; White bricks represent Oxygen atoms and Yellow bricks represent Chlorine atoms. Black beams represent the chemical bond. 2. Have students construct a molecule of hydrogen chloride (HCL). Use a yellow LEGO square for the chlorine atom and a red square for the hydrogen atom. Connect the two "atoms" with a black LEGO beam. Discuss uses of HCL. 3. Next, have students prepare a model of a water molecule from three LEGO bricks (2 red and 1 white). What happens if we add another oxygen molecule? Now we have H₂O₂! What can we do with hydrogen peroxide? 4. Continue in this fashion adding and subtracting molecules and creating new acids and bases and discussing the uses of them.

Lesson Learned: *Students can make models to help them understand acids and bases. The models can be made from LEGO bricks of varied colors connected with the black thin LEGO plates. The black bricks would represent the chemical bond that hold the atoms in molecules together.*

Scale It

LEGO Smart Creativity Contest Entry

By Kathy Galbreath, ParentSmart

Pre-K Version The items received in the kit are put into a container and children are given a set of scales. The children will explore the different pieces given to decide what variation it takes to show an equal balance, left side heavy, right side light and vice versa. They will then make a chart using the shape and color of the LEGO brick they used to show which variations demonstrated which effect. Elementary Version The elementary version of a similar activity is to specify the weight amount for each item in a key form. (example: large grey brick = 1,000 lbs.) Then the students will work mathematically to decide what variations it will take to balance equal a certain amount as requested by the teacher. For example: which bricks would you have to have to = 2200 lbs.? This would all be done in accordance to the original key. This activity could be done as a group or individually.

Lesson Learned: *Students will explore weight measurement, hand-eye coordination and depending on the age could integrate team building.*

Follow Me

LEGO Smart Creativity Contest Entry

By Tammy Hamilton, Fremont Junior High School

During this activity, students must write procedures for how to build an object they design themselves. They can either write the procedures as they go along, or, they can completely build their design and then write their procedures. 1. Divide the class into groups of 3-4 students. 2. Give each group a bag with all of the same LEGO bricks inside. 3. Instruct the groups to build anything they would like using all of the bricks inside of their bags. 4. They will need to write procedures as to how to build their design. It is important to have them use only words in their procedures. No pictures. 5. After all groups have completed their designs and procedures, use a digital camera to take pictures of the designs, collect the procedures and have the students take apart their designs. 6. The next day, shuffle the procedures and pass them back out to the groups, making sure no group receives the procedures they actually wrote. 7. From the new set of procedures, have them build the object the other group had designed, then compare what they were able to build to the actual design. 8. At the completion of day 2, we ask our students to do a reflection and answer 9 questions about the activity. The questions are divided into 3 sections: Section 1 is related to the actual writing of the procedures; Section 2 is related to the following of procedures that someone else wrote for them; and Section 3 asks them what they would do differently the next time. Students definitely learn a valuable lesson about the importance of effective communication and writing clear and concise procedures.

Lesson Learned: *Throughout this activity, students will learn team building skills, communication skills, and how to write and verbalize directions.*

Back-To-Back Building

LEGO Smart Creativity Contest Entry

By Cathy Ramirez, Orenda Education's Williams House School

Students will break up into groups of 2 and one student will begin as the builder, the other as the listener. The builder will construct a simple design of his or her choice, with the LEGO bricks provided. The builder will then attempt to get his/her partner to reconstruct the exact same design without turning around. The listener may not see the builder's design and will attempt to follow specific directions from the builder and re-create the design. While the two students are communicating, the listener is limited as to the questions/comments he/she can make. The listener can only ask for clarification by saying, "Unclear". The builder may respond by restating

the directions. Once 10 minutes has elapsed-time is up. The students will then compare their

designs and see if the listener was able to successfully recreate the builder's original design. Now the students will switch roles and complete the activity once again. At the end of this activity, discuss communication and roles within a conversation. Teachers can also discuss directional terms such as parallel, adjacent, perpendicular, etc. as the students will utilize this vocabulary in this activity.

Lesson Learned: *Students will practice effective communication skills. Students will have a better understanding of the role that listening plays in communication. Students will practice giving and receiving directions. Students will get practice with using directional terms. Students will also have an opportunity to reflect on the frustration that is involved when your communication is limited, as it is during this activity.*

Pack It In There

LEGO Smart Creativity Contest Entry

By Warren Marcelino

Either by team or individual the goal is to create the smallest object with using the most amount of LEGO brick to create the tightest pattern possible within the allotted time.

Lesson Learned: *Spatial relations and out of the box thinking.*

Layers of the Earth

LEGO Smart Creativity Contest Entry

By Cody Hay, Oak Grove Middle School

The flat green LEGO plate is the crust. It is thin compared to the other layers, just like the crust. The green and blue beams go on top of the plate. They form the ground and a river flowing through it. Underneath the light green plate is the red plate. It forms the upper part of the mantle that is solid. It is not very large either. Underneath that, the orange bricks represent the main part of the mantle. It is thick. Below the mantle is the outer core. It is represented by the yellow 2X4 brick. It is hotter than the mantle, hence the yellow coloring. At the bottom is the gray 2X6 brick. It represents the solid iron inner core.

Lesson Learned: *Students will be able to see the different layers of the Earth and how they relate in thickness.*

LEGO Town

LEGO Smart Creativity Contest Entry

By Tammy Baynard, YMCA

We had the kids design a city, they had to build roads, buildings, bridges and landmarks. We had two groups of 24 kids. They had to use their imaginations with paper, LEGO bricks and other objects they could find in the room within a matter of minutes they had their towns designed on paper.

Lesson Learned: *to work together as a team*

Working Together

Working Together

LEGO Smart Creativity Contest Entry

By Jan Mata

I gave each team a bag filled with a certain color LEGO brick. They had to take turns using their color bricks to help build something together.

Lesson Learned: *My students learned team building skills.*

Building Our School/Community

LEGO Smart Creativity Contest Entry

By Keith Kaplan, Newark Public Schools

The Big Picture Urban Academy is a new school for at-risk students being introduced into the Newark School system designed around twice-weekly internships and small group instruction (15 students) in close knit advisories where activities and experiences are shared. Much of the first quarter is aimed at community building, with plenty of time for reflection, and I think the use of the lego education kit to enable students to creatively express their sense of the school/community helps to foster that togetherness essential to proper functioning of the advisory.

Lesson Learned: *Team building skills, how to communicate with others, hand-eye coordination, shapes and functions, creative brainstorming, shared experiences*

Building The Pyramids

LEGO Smart Creativity Contest Entry

By Michael Shields, Christian Liberty Academy

It would start with a flat LEGO plate. The students would begin by placing the assorted sized bricks around the perimeter of the LEGO board. If enough bricks are available the whole board could be covered with assorted bricks to create a full layer. Moving ONE strip in, the kids would start a second layer by placing the bricks around the perimeter and filling the middle in with more bricks. This layering would continue until the the LEGO bricks have reached the layer where only 4 bricks complete a full layer. To be complete, bricks would have to create a "TOP" such as a cone shape to place on top

Lesson Learned: *Groups of three to four students build the three pyramids during sessions of Egyptian history. As pyramids are finished, they could also build The Sphinx to re-create the Egyptian landscape*

LEGO Evolution

LEGO Smart Creativity Contest Entry

By Teri Kleine, Dejean Academy

Arrange LEGO bricks into a LEGO "family tree". Determine each brick's common ancestor and subsequent evolutionary forms based on traits of LEGO pieces. Students can use their imaginations to identify environmental pressures that selected for certain adaptations and/or led

to branching in the family tree. Students can work cooperatively in groups, or work individually and share their ideas with each other after completing a hypothetical family tree and debate different hypotheses.

Lesson Learned: reinforce biological concepts/vocabulary, classifying, communication

Once Upon A "LEGO Tale"

LEGO Smart Creativity Contest Entry

By Patricia Varley, Emma E. Booker Elementary

Each student will receive a bag of LEGO bricks. They will have time during our 1/2 hour writing block daily for a week to create a character or characters from the bricks. They can choose to work by their self or work with partners. They will document their character/s using a digital camera so they may print a picture to use in a copy of their finished story or to download into a computerized version of their story. As they create their character, the students can generate and organize their ideas using a storyboard. After the planning period students will write a draft, respond to peers stories using questions and comments, revise, edit and publish their "LEGO Tale". These published tales will be shared with other classes in the school.

Lesson Learned: Using LEGO bricks as a springboard to teaching students fictional writing, students will learn to use their imagination to create a fairy tale character or characters from bricks that they will write a story about. This LEGO character will help them generate ideas for writing and planning their "LEGO Tale". There is room for possible collaboration with classmates if they care to co-create characters and tales.

LEGO Procedures

LEGO Smart Creativity Contest Entry

By Stacey Reed

1. Students should be placed into pairs, either by the teacher making them or the students choosing their own partner.
2. Each student pair needs an "A" and "B" bag of LEGO bricks, a pencil, paper, and paper towel. (Contents of the A and B bags must be the same. Numbering them works well; the contents of 1A+B do not have to match 2A+B though.)
3. Each pair should construct something from their A bag only.
4. Each pair should write the directions(aka procedures) to creating their masterpiece.
5. Once they have created their masterpiece, the pair should cover it with the paper towel.
6. The directions and B bag are given to another group.
7. The other group must construct the masterpiece from the directions and B bag. (No peeking at the correct configuration!)
8. Discussion follows:
 - a. Was this task easy or hard? Why?
 - b. What would have made the task easier? Why?
 - c. What were some problems that you faced in this task?
 - d. What would you do next time?
 - e. What did you learn from this activity?

Lesson Learned: Students learn team-building skills, communication skills, problem-solving, the importance of procedures, and the importance of writing detailed procedures.

Mixtures Atoms and Compounds

LEGO Smart Creativity Contest Entry

Given a diverse pile of LEGO bricks. Students are instructed to create three piles of matter-elements. compounds and mixtures

Lesson Learned: Arrange the LEGO bricks in piles of mixtures, compounds and elements. One student directs another verbally, one follows directions of first and last one lists the characteristics of each type of matter.

Build Your Spelling Skills

LEGO Smart Creativity Contest Entry

By Brendan Hannum, PAVCS

Arrange LEGO bricks in order from smallest to largest (by number of dots), and assign letter values alphabetically to each brick: pink 1 stud=A, yellow 2 stud=B, green 2 stud=C, white 4 stud=d, orange 4 stud=E, yellow 4 stud=F, yellow 4 stud (w/eye)=G, green long 4 stud=H, Black long 4 stud=I, red 6 stud=J, green 6 stud=k, blue long 6 stud=L, red 8 stud=M, orange 8 stud=N, black 12 stud=P, (skip Q, gray 12 stud=R, green 12 stud=S, light green 16 stud=T, blue 16 stud=U. Students would 'build' words using the appropriate LEGO brick sequence as a means of studying & learning to spell. Obviously this works only for simple, kindergarten level words without repeated letters, but the concept could be adapted by adding more blocks to the arrangement.

Lesson Learned: hand eye coordination, tactile approach to spelling skills, recognize patterns in spelling

Submarine Ballast

LEGO Smart Creativity Contest Entry

By Kathryn Haygood

Build a raft using the 4x4 light green LEGO brick as a base. Test the raft in a container of water to make sure it floats. Have the students add coins in any amount or denomination until the raft sinks. The coins can then be added or subtracted to make the raft float or sink, much like air acts as a ballast on a submarine. A discussion can then take place about the best raft designs and what is the maximum number of coins used until the raft sinks.

Lesson Learned: The students will learn about buoyancy.

Preliminary Balance In Figure Sculptures

LEGO Smart Creativity Contest Entry

By Holly Weitknecht, Northampton Area School District

This activity is intended for use in a high school classroom, but can be use throughout k-12, probably with little modification, other than expectations of outcome levels. Beginning a figure sculpture lesson or unit: Prior to students working in a more unforgiving, and potentially more expensive material, such as clay or stone carving, students should experience balance. 1. Have students play a "quiet" game of "red light green light" down the hall. Whenever "red light" is called, direct their attention to where they feel their body weight balancing, as well as these more natural, less stiff positions of their body. Surprisingly, my older students love the opportunity to do a "child's" game, and break out of the normal routine. 2. After experiencing natural balance in their own bodies, take the time to sketch figures with a natural position, trying to achieve balance and weight. Pick 1 to develop into a sculpture. 3. Break out the LEGO bricks! Have students build their figure in 3-d, using the bricks as a trial run material being sure to achieve the natural form and balance of weight before starting on their good copy in a more

to achieve the natural form and balance of weight before starting on their good copy in a more traditional art material. (This lesson can easily tie into art history, by studying Paleolithic Venus figures, cultures such as Egyptian or Greek, or many specific artists, such as Michelangelo, or even Deborah Butterfield to inspire student's sculptures.)

Lesson Learned: *Students often struggle with creating realistic, relaxed balance in sculpture, particularly on figures. Major goal: Students will experience how to create and apply both physical and aesthetic balance, as a preliminary exercise prior to applying the learned skills to a final sculpture*

Peg Madness

LEGO Smart Creativity Contest Entry

By Carolyn Jett, Butler RV Schools

1. Divide class into groups of two to four students. Give each team a package of LEGO bricks.
2. Have the teams look at all their LEGO bricks without counting.
3. As a team, estimate the total number of LEGO bricks in their package. Write this number down.
4. As a team, estimate the total number of studs on all the bricks. Write this number down.
5. Working together, without doing any building, try to visualize a structure that could be built from the bricks that would have the fewest number of studs left uncovered. (Give students about 3 minutes to do this.) Draw a quick sketch of the structure.
6. Working together, write a simple formula for calculating the approximate number of studs that will be left uncovered. (for instance, total number of studs

divided by total number of bricks, multiplied by four.)
7. Construct the structure out of bricks that the team sketched and count the number of studs left uncovered. Compare the actual number of studs to the estimated number. Was this number close? Which of the two solutions was closer? Were either close?
8. As a class, discuss which team was able to guess the closest number to their structure's total, which team was able to create a formula closest to the actual number, and which team was able to build the lowest number of studs left showing.
9. If time permits, let teams reconstruct their structures based on observations during discussions, or have them rework their formulas, based on experiences.

Lesson Learned: *estimating, visualizing, creating formulas, problem solving, team work*

Visual Perception

LEGO Smart Creativity Contest Entry

By Suzanne Loftus, Council Rock School District

Students will create object with LEGO bricks using various numbers of bricks. You will need a timer for this activity. Create and take pictures of objects created with bricks. Assign values for the complexity of the design. (Maybe if you are studying money you can assign coin amounts, county by numbers etc.) Create a stack of cards with the image on one side and a value on the other. Students will turn over a card with the image and create the object. Once a person has confirmed that the design is correct they will keep the card in a pile and flip over another. Once the time has expired they will add up the total points of the cards they completed during the time period.

Lesson Learned: *Students will view an image of various LEGO bricks and need to construct the exact same design. Visual perception and execution.*

Keep It Smart

LEGO Smart Creativity Contest Entry

By Ross Bussell, Mesilla Park Elementary School

Both classrooms are of 4th grade students) in this activity. They will have to communicate with classmates and with the partner class in order to meet all goals of the assignment, and work spatially in order to complete their project in the given time period. There will also be a technology component in which students must be able to navigate in order to successfully complete the project. Students will work in groups of four to build a structure that utilizes all of their bricks. They can build anything they would like. The students will write down step by step instructions on how to build their structure. Photos of the structures will be taken before they are dismantled. When the structure is complete, students will log into the online classroom environment (Moodle), and through a threaded discussion with their partner group, upload their instruction sheet. The LEGO bricks will then be dismantled and given to the other classroom. They will then attempt to build the structure using the instructions given. When they are complete, they will take a photo of the structure. Once the activity is complete, photos will be compared to see how good the instructions were. The teams will then use threaded discussions in the online environment to discuss how the project went and what could be changed. Finally, the project will be done again, with the partner class building the structures and writing the instructions.

Lesson Learned: *Students will work in teams of 4, and will collaborate with their partner class online (we use Moodle to do activities with a partner class from across town).*

Copy Cat

LEGO Smart Creativity Contest Entry

By Debbie Jirgal, Home School

Have two students work together on this project. They will face each other with a cardboard stand between them so they can not see each other's hands. Give each child the exact same LEGO bricks. Have the first child build something with his/her bricks. This child will then explain to the other child how to build the same thing, step by step. This will require the child to explain the size of the LEGO brick first used, it's color and shape. The child then will explain the location, size, color and shape of the second piece and so on until that child has finished the last LEGO brick. When completed, the cardboard shield is removed and they see if both pieces match.

Lesson Learned: *Students learn how to communicate using detailed descriptions. This works well, especially when teaching small children the difference between large and small, colors and shapes.*

Construction

LEGO Smart Creativity Contest Entry

By Pamela Smith, Monroe Middle

The project consisted of an activity from the Construction Career Cluster. Students were to explore the career of a brick mason. They were to build a 4"x4" LEGO wall. Once the wall has been completed it will be used for another group of students to practice for Future City Competition by developing a city for the future. 1st step - students were divided into groups of 4 they were to review the handout with details regarding what they were instructed to do. 2nd step- student #1 is assigned to measure the height & student #2 is to measure the length of the LEGO bricks. Determine how many bricks will it take to construct this wall. 3rd step - student #3

record information on paper. 4th step - student #1 will lay out the 1st layer - student #2 will add the next layer. 5th step - they will continue building & student #3 will advise them of the time left & student #4 will check the height 6th step - team will discuss their project to ensure that it comply with the instructions 7th step student #3 will record information on handout 8th step - advise teacher of status - teacher review for accuracy - 9th step - students #1,2,3 clean work station - student #4 give ok teacher confirm & dismiss class

Lesson Learned: *Students completed various skills while completing this activity. They learned how team-building skills how to work with their partner & implementing various duties to get the project completed. They learned how to handle time management skills. Realizing that in the real-world you have to those skills to work effectively. Listening & communication skills were important skills because not working as team by listening what your team member had to say could be detrimental for the team. Manual dexterity was important in building the overall project.*

Time Trials

LEGO Smart Creativity Contest Entry

By Kathryn Haygood

The teacher will have a couple of prebuilt structures made from the LEGO Smart Kit. Showing the students one of the structures, the students will be expected to recreate the structure as quickly as possible. Times will be recorded and graphed. This can be repeated with other structures. As a challenge, the students could start over and try to improve their time for a specific structure, or they could be asked to recreate the structure after only seeing it for a couple of minutes (and then having it hidden from view). All times can be graphed and compared.

Lesson Learned: *The students will improve upon their memory skills and spatial orientation of bricks. They will also learn graphing.*

Save The Residents

LEGO Smart Creativity Contest Entry (JULY WINNER!)

By Elizabeth Croes, ASRCS

Each student is given a LEGO Smart Kit and a piece of paper containing a map. On the map is a picture of two islands in the middle of the ocean. The problem is: There are two islands in the ocean - one of the islands is inhabited by a population of 20 - the other uninhabited. You live on the inhabited island, which is rapidly deteriorating and sinking as a result of soil erosion from the rough tides and coastal winds. You and the other Islanders have decided to move to the more stable island. You have limited resources to help you with the move - the 20 piece LEGO Smart Kit - the kit pieces can represent any material you need (paper, brick, iron, steel, etc - but once the material(s) are determined they cannot change. You must build something to assist you in the move from one Island to the next - you are quickly running out of time - the next High Tide is in 12 hours... Be prepared to give a presentation on what you built to help you move...

Part Two: You have successfully relocated the population - and as you watch the other island sink, you and your peers have decided they need to be proactive at protecting their new home...what can you make by taking apart the structure you built and using the materials to address some of the concerns? (soil erosion, rough tides, sinking etc...) Be prepared to give a presentation on your solution.

For part one some students made boats, bridges, surf boards, wind surfers, rafts, planes, etc.... most built a wall around the island to help with the tides....

Lesson Learned: Team building, problem solving, creativity,

Frustrated With Fractions

LEGO Smart Creativity Contest Entry

By Shelley Kappeler, Brick Buddies LEGO Afterschool Program

Using the studs on top, set out two bricks, one with 4 studs, one with 8 studs and ask the student what fraction that represents, $\frac{4}{8}$ th, and then if using the LEGO bricks, if he/she can reduce it and pick out two bricks that would represent the correct answer. Then pair students in groups of two to create quick LEGO problems for each other. After each round, they stack the bricks on top of another creating a small tower. When all of the bricks have been used and the tower created, the lesson is over.

Lesson Learned: Adding & Subtracting Fractions, Finding Equivalent Fractions, Math Skills, Working with a Partner

Center of Gravity Activity

LEGO Smart Creativity Contest Entry

By Sylvia Zinser, Dominican University

1: for students in 4th-8th grade: Classroom team contest: build a stable structure using all parts of the LEGO Smart Kit which fulfills the following conditions: (a): All bricks are firmly connected with each other. (b): It rests only on one of the 2x2 bricks without tipping over to any side (It might resemble an irregular, upside down pyramid). The classroom winner is the team whose structure spans the largest area. The area will be determined by looking from the top side onto the structure and counting the visible LEGO studs. Holes are allowed to maximize the area. 2: for high school kids: Classroom team contest: design a stable structure using all parts of the LEGO Smart Kit after using a scale to determine the mass/weight of each type. Draw two copies of the design on paper. Turn in one copy of the plan to the teacher and then build the structure using the second copy. The structure has to fulfill the following conditions: (a): It has to match the construction drawing. (b): All bricks are firmly connected with each other. (c): It rests only on one of the 2x2 bricks without tipping over to any side (It might resemble an irregular, upside down pyramid). The classroom winner is the team whose structure spans the largest area. The area will be determined by looking from the top side onto the structure and counting the visible LEGO studs. Holes are allowed to maximize the area.

Lesson Learned: Team building as well as the addition of single centers of gravity to an object's total center of gravity.

Imagination - Builders of the Future

LEGO Smart Creativity Contest Entry

By Anna Fleming, St. Patrick's School

Every few weeks throughout the school year, a new theme will be presented to the students and the teams will be tasked with creating something with the LEGO bricks to compliment that theme. All items will be photographed with their creators and the photos will be placed in a journal with a description dictated by the students. They will tell how they went about making the object, any problems they encountered, how they resolved the problem, and how the

creation connects to the theme.

Lesson Learned: *Students will be assigned teams and cooperatively complete their creations. They will build skills in communication, working as a team, problem solving and enhanced curriculum goals.*

LEGO Higher and Higher

LEGO Smart Creativity Contest Entry

By Tina Duver, Allendale Columbia School

1) Students are to take the LEGO bricks in the kit to design the highest free standing structure they can using the least amount of bricks that can support a .5 kg object. (The weight can be changed by the instructor to suit the needs of the class). 2) After 20 minutes of experimentation and teamwork, the structures are tested and measured. Only structures that can support the .5 kg weight will be considered. 3) The height (in cm) to number of LEGO brick ratio is determined for each group. A 10 cm height using 5 bricks would be a ratio of 2. 4) The team with the lowest height to brick ratio wins.

Lesson Learned: *Students learn how to work together to work to a common goal. There is no definitive answer, so students must learn to reason and communicate scientific fact in order to accomplish a task. Scientific testing and re-testing is encouraged and promoted through his activity.*

LEGO Math Facts

LEGO Smart Creativity Contest Entry

By Karen Silva, Homeschool

Instructor will select one or more LEGO bricks from the LEGO Smart Kit and place in front of students and ask for an appropriate math sentence, based on number of LEGO studs. First student to call out (or raise hand, if doing activity with large number of students) wins the bricks. Examples: Given a 2x4 brick, answers could be $2 \times 4 = 8$, or $4 + 4 = 8$. Given a 4x4 brick along with a 2x2 brick: $16 + 4 = 20$, or $4 \times 5 = 20$. Advanced variation: Give student the LEGO bricks (for large groups break students into teams, where each team should have a LEGO Smart Kit). The Instructor calls out a number. The student must quickly find the right combination of bricks to create an equation which will equal the given number. Example: Instructor calls out 44. Student grabs an 8x2, two 2x2's, a 4x4 & a 4x1: $16 + 4 + 4 + 16 + 4 = 44$.

Lesson Learned: *Math fact review, mental math*

Ionic Compounds

LEGO Smart Creativity Contest Entry

By Elaine Gibbs, Middleton High School

Give the students LEGO bricks to build with and a list of binary ionic compounds. Have the students choose appropriate LEGO bricks to represent ions and fit them together to represent and Ionic Compound. They can work in a team to see who can complete the most Compounds first. You can assign different colors to represent different families. This would mostly be to distinguish metals from Nonmetals. This would illustrate you can only make an ionic compound with opposite (metal and nonmetal) families

with opposite (metal and nonmetal) families.

Lesson Learned: *That electrons are transferred in ionic compounds.*

Electron Orbitals

LEGO Smart Creativity Contest Entry

By Elaine Gibbs, Middleton High School

Give the students LEGO bricks and a paper. Ask them to build a model explaining orbital filling sequence. If they need direction, you might give the explanation of 2 electrons for s sub-level, 6 electrons for p sub-level, 10 electrons for d sub-level. Let them complete their own design sequence and explain to their group. You might take the best and display for future reference.

Lesson Learned: *Electron orbital filling sequence, group collaboration*

Scaled Models

LEGO Smart Creativity Contest Entry

By Lori Barbers, Manheim Township HS

Beginning with a paper and pencil design, students will draw the types of building construction which constitute aspects of a city. From that design they will construct a 3-D model using LEGO bricks. Students will work in groups of 2-3 to construct their model and as a group will construct the city. The city will be named by the students. We will then use ratio and proportion using LEGO bricks and mason bricks used to build buildings. Students will need: pencils, paper, ruler, graph paper, LEGO bricks, calculator.

Lesson Learned: *Students will use ratio and proportion to design a city. Students will understand that ratio and proportion is used to create scaled models. Students will choose one aspect of a city, working in groups of 2-3 they will construct buildings, homes, garages, hospitals, etc. As a class they will contribute their individual construction to create the city.*

Literary LEGO

LEGO Smart Creativity Contest Entry

By JJ Martin, Assumption School Enrichment

1. Pick a book (ie. "The Ugly Duckling") 2. Read book 3. Discuss character that they would like to make with LEGO bricks. 4. Pass out a set of bricks. 5. Make character from book. (ie. the duck/swan from ugly duckling) 6. Discuss with student why this particular character chosen? 7. After completed ask student questions regarding choices of bricks? Why use the yellow, and not the white to represent it as swan later? etc...5. Complete with no wrong or right way to represent character. It is students imagination that makes it work.

Lesson Learned: *Students learned to not only visualize a character from book, but help others see what they are visualizing.*

CCC/POW Vehicle & Building Creation

LEGO Smart Creativity Contest Entry

By Becky Rose, Homeschool

There will be teams of four per item. Students may decide what they want to build. Aircraft

(Aircraft, Military, and a LEGO City. The winner will be the one who builds the most

(Advanced)- Will need gray LEGO bricks. They will need to figure out how to design an airplane in which the body will be able to support the wings. They will also need to figure out how to design propellers as the airplanes need to look like those from WWII. Graph paper will be made available along with rulers and pencils. Tank (Medium)- Hunter green legos are needed with some wheels. They will need to draw and design a military tank so that the gun barrel is supported and could also be rotated. Track wheels will also need to be designed. Graph paper, pencils, and rulers will be supplied for design. Ship (Advanced)- A warship will be designed by the students. May be a fighter ship or aircraft carrier. Will need gray & black legos. Graph paper, pencils, and rulers will be supplied for design. Barrack Compound (Easy) - Dark green LEGO bricks needed to design barracks or support buildings of the CCC/POW compound. Doors and windows needed for the buildings. Graph paper, pencils, and rulers will be supplied for design. Math and science (physics) will be used in all areas of creation. Communication skills will be needed on the teams as they work together.

Lesson Learned: *We have a museum of the CCC/POW of 1930-1946 in which is being restored. In this facility we will have children create airplanes, tanks, ships, or a LEGO compound that was originally built. They will need to work together (team building) to design the item that they choose to build (logic & critical thinking skills). It will enhance communication skills as they work with team members. They will then be able to display their completed item in the museum. Goal: Successful achievement of a goal and displayed indefinitely in the museum.*

Do As I Write, Not As I Say

LEGO Smart Creativity Contest Entry

By Adrienne Batt, Fairview Middle School

Students will work with partners. The first partner must create an object using any number of LEGO bricks. They must then write specific details as to how to construct that object. They should be given only 30 minutes to accomplish this. The second partner will then use the written directions to recreate the first partner's object. The second partner may not see the first partner's object until he has completed his recreation. The second partner is also given a time limit of 30 minutes.

Lesson Learned: *The students learn to write clearly and concisely. The individuals learn to communicate their intentions through written word. They must also learn to interpret written directions.*

Guess What?

LEGO Smart Creativity Contest Entry

By Tamala Howard, Home Educator - Grade K

Can be played with two or more people. If playing with two people, sit them back to back. If playing with more than two, pick one student to build and sit the rest so they can't see the builder. The builder will build something out of LEGO bricks and then start describing the object one clue at a time. After each clue, the other students can guess what the object is. Whoever guesses the object first wins and can be the next builder. If playing with two people, the LEGO bricks can also be split up and both can build an object and see who guesses the other first. They win. Switch bricks and play again. Example - Builder makes a plane without showing it to the other student(s) and says it has blades. The other student guesses grass. The builder says it flies. The other student guesses parrot. The builder says made of metal. The other student guesses plane. They got it right and it took 3 guesses.

Lesson Learned: Students learn to use their imagination to create an object out of the blocks. They also learn to communicate better. It expands their vocabulary. It helps their listening skills.

3-D Views

LEGO Smart Creativity Contest Entry

By Trisha Schlachter, Fairview Middle School

Using the given LEGO bricks, students create a design and then must draw the design from three positions.... FRONT, SIDE, TOP using graph paper.

Lesson Learned: Hand-eye coordination, 3-D spatial sense

Balancing Chemical Equation

LEGO Smart Creativity Contest Entry

By Sara Marchlewicz, University of Illinois at Chicago

Students use different colored LEGO bricks to create molecules. Make sure atoms of the same type are the same color. Attach atoms to make molecules. Students will then use them to balance equations, seeing how the molecules of reactants are rearranged to make products as well.

Lesson Learned: Balancing chemical equations, law of conservation of mass

Sunshine and Shadow

LEGO Smart Creativity Contest Entry

By Cindy Marsch, Home School

Student is challenged to build something that looks as though it is partially in sunshine and partially in shadow. Possibilities: using darker shades to represent shadow and lighter to represent sunshine OR using black, white, and gray to represent shadow and the other colors to represent sunshine.

Lesson Learned: Artistic concepts of light and color, aesthetics of building an object from limited possibilities

How Long?

LEGO Smart Creativity Contest Entry

By Cindy Marsch, Home School

Student will make the longest possible structure that holds together when pulled a few inches. Variation: make the longest possible structure that will sit flat on the tabletop and not rock or teeter.

Lesson Learned: Physical properties, engineering concepts, balance,

Half Steps

LEGO Smart Creativity Contest Entry

LEGO Smart Creativity Contest Entry

By Cindy Marsch, Home School

Given the challenge to "make a set of steps in which each step is half the size of the one below," the student can make these configurations: 16-dot, 8-, 4, and 2-dot steps

Lesson Learned: Visualization of math relationships, conceptualization of fractions

Multiple Steps

LEGO Smart Creativity Contest Entry

By Cindy Marsch, Home School

One student builds a set of "steps" with the sixteen-dot, twelve-dot, eight-dot, and four-dot bricks, then uses his creation to recite the multiples, "stepping" a four-dot brick down each level:
 $1 \times 4 = 4$ $2 \times 4 = 8$ $3 \times 4 = 12$ $4 \times 4 = 16$ Alternative: one student builds the steps and the other demonstrates the math principle involved. This could just as easily be $4 + 4 = 8$ $4 + 4 + 4 = 12$ OR $4 + 8 = 12$ and so on

Lesson Learned: Perception, internalization of math facts, visualization of math facts, communication with a partner.

Seussimals

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Read or let the children read Dr. Seuss' On Beyond Zebra, which is about weird creatures whose names begin with letters beyond Z. Ask the kids to make up their own letters beyond Z, use them to name seussimals, and then to construct the creatures using their LEGO Smart Kit. Then go around the class and ask each child to explain their letter and to tell a little bit about their creature.

Lesson Learned: K-3, Love of reading, imagination

Listening Skills

LEGO Smart Creativity Contest Entry

By Christina Morgan, Unionville Chadds Ford School District

1. Put the students into pairs sitting on the floor back to back. 2. Give each student the same materials. 3. Student 1 builds an object with the LEGO bricks. 4. Student 1 needs to tell Student 2 exactly how to build the object. 5. Once finished, they sit next to each other to compare their objects. 6. The students need to discuss what they did well and what they should have done to make their objects match better. 7. They need to write down their observations in a paragraph form so that their ideas and suggestions are written clearly. 8. The class as a whole discusses the activity both positives and ways to improve.

Lesson Learned: team building skills and listening/communication skills

LEGO Apprentice

LEGO Smart Creativity Contest Entry

By Neena Grosvenor, Silver Lakes Middle

This activity is designed to teach middle school students entrepreneurial skills and steps to perform research. Students will be placed in groups of 3-4 students. Each student will have an assigned role. Business manager, architect, designer, research technician, writer/presenter. Each participant is responsible for a working understanding of the product created. The product should be beneficial to society and support the "going green" initiative. Students will use freeware software applications such as Google Sketch Up to design their product. To begin, students will be instructed on how to use a variety of computer software applications such as Inspiration for organizing their ideas and brainstorming. A list of online resources will be provided. Print resources will also be introduced. Students will receive instruction on performing research. Day 2 & 3--Students will get into their groups to begin discussing what their product will be. They will use Inspiration to begin recording their ideas. Students should begin researching their product idea to see where it can positively impact society. They should identify the need for the product. Each group will receive an assessment rubric which will be discussed in class. Day 4-- Students will be introduced to Google Sketch Up. They will spend the remaining class time exploring the site and getting used to the functionality. Day 5-9 Students will begin designing their product/prototype using Google Sketch Up. When the group feels that their preliminary design is complete, they will receive LEGO bricks to begin building their product using the sketches they designed. The design must be beneficial to society and be environmentally friendly. Clearly Written instructions on how to build the product should be included along with the final product and presentation. Day 9-13 Students should decide on the type of presentation tool they will use to present their idea and product. They will receive instruction on PowerPoint, Keynote, and iMovie as choices to use to present their final product. Students will begin building a presentation to present to their class. Day 14-15 A panel of judges will rate each presentation and product based on an assessment rubric.

Lesson Learned: *Students will learn the skill of collaboration and product design. They will learn presentation skills and the art of promoting their product.*

Fractional Parts

LEGO Smart Creativity Contest Entry

By Stacie Craig, Craig Private Academy

This activity uses the LEGO pieces to teach fractions. Compare a smaller LEGO piece to a larger piece. Have the student answer the following questions. How big is the small piece? How big is the large piece? How many of the smaller pieces would fit on the bigger piece? How can that be represented as a fraction? Can the fraction be simplified? This process can be repeated over and over using different LEGO combinations and creating different fractions.

Lesson Learned: *Students learn how shapes relate to each other and relative sizes. They learn to visualize parts of a whole.*

Driver Education-Simulating Driving Scenerios

LEGO Smart Creativity Contest Entry

By Kevin Gable, Northern Bedford County High School

This activity is created to enable students to create a driving scenario from the ground up to allow them to see all the steps in interpreting a traffic situation including cause and effect. First students must brain storm to decide what scenarios to depict and what educational message will sent with the completed presentation. Students must then create or build the vehicles that will be included in the scenario, as well as, the environment around the vehicles. The students will prepare an area that will provide proper lighting to photograph the scenario and a digital camera

Lesson Learned: Students work in groups to first brainstorm what driving scenarios to simulate. Students will work as a team to create a script of movements that will be needed to carry out the simulation. Students will need to coordinate the activity to create the final product by photographing, analyzing the quality of the photograph and connecting all photographs to create a finished product. The implementation of technology in the class room is a focus of this lesson.

Lesson Learned: The students will learn about cantilevers and counter-weights.

Lesson Learned: Team play, Mind storm play, Deep Associated thinking

Explain to the students what Surface is. Then separate the pink 1x1 brick and the slope bricks from the others. Then ask students to separate the rest of the bricks by equal surfaces. Some of the bricks have the same shape and the same surface (4x2 bricks and 4x2 plate), but some of the bricks have different shape but equal surface (8x2 brick and 4x4 plate).

Lesson Learned: Simple Mathematical Surfaces, some think may look different but to be equal

Create a LEGO Smart Alphabet

LEGO Smart Activity

By Daniel Ilkov, Landscape Architect

Create a LEGO Smart Kit ALPHABET: separate all the bricks from the LEGO Smart Kit from the other elements. First the teacher writes the alphabet on the blackboard, to show the letters to the students. Then the teacher asks students to create all the letters one by one.

Lesson Learned: Students learn the Alphabet, how it looks every letter, how to create it.

Be A Start With LEGO

LEGO Smart Creativity Contest Entry

By Karen Skophammer, Manson Northwest Webster School

The students have studied the constellations of the Northern Hemisphere. Using an illustration of constellations such as The Big Dipper, each team of students uses a bag of LEGO bricks to form a replica of a constellation. The constellations are then photographed and hung on a bulletin board. The photos are numbered and each student moves along the numbered photos with a numbered sheet of paper and guesses at the constellation's names as a type of reinforcement quiz. The students love this activity!

Lesson Learned: Team work, hand-eye coordination, problem solving skills, comparison skills and proportions are learned during this unit on building a replica of one of the constellations.

Phases With LEGO Bricks

LEGO Smart Creativity Contest Entry

By Karen Skophammer, Manson Northwest Webster School

Each team of two students uses the package of LEGO bricks to build a model that represents one of the phases of cell division such as Interphase, Prophase, Metaphase, Anaphase, Telephase, cytokinesis, etc. The students have already studied these phases and have access to a drawing of these phases in their books. The teams use the bricks to make a model of these phases. The team that most accurately builds the most models and photographs them to show to the class earns the privilege of instructing the next class in the "how to" of building the phases. This is an exciting learning unit!

Lesson Learned: Team work, problem solving skills, comparison and hand-eye coordination plus learning the phases of cell division are achieved by using one package of LEGO bricks.

Something Fishy With LEGO Bricks

LEGO Smart Creativity Contest Entry

By Karen Skophammer, Manson Northwest Webster School

Students use the LEGO bricks in the kit to construct an underwater sea creature by joining or attaching the bricks sideways (the bricks snap together either left or right instead of on top of each other) and create a colorful underwater creature. This creature has one eye; when finished, it should be able to become part of a finished painting or work of art. Part two of the lesson is creating a work of art such as a painting or drawing and applying the creature to the

Lesson is creating a work of art such as a painting or drawing and applying the creature to the work of art and photographing it with a digital camera to feed into the computer-VOILÀ! Instant 3-D art featuring a LEGO creature!

Lesson Learned: *Students learn hand-eye coordination through building an underwater sea creature using only the bricks in the LEGO Smart Kit. This activity is unique because the students are asked to build the "creature" connecting the bricks sideways so that the creature lies flat so it can be attached to a painting or artwork!*

Building Literary Bridges with Bricks

LEGO Smart Creativity Contest Entry

By Leslie Carlis, Overbrook High School

After reading Romeo and Juliet, learning teams will construct several set designs using LEGO bricks. Each set design must have a distinct theme that is represented in the design. Then, they will present these designs to drama students/stage crew who will begin to brainstorm what materials they will need to construct these sets.

Lesson Learned: *Students will apply their knowledge of literary terms like setting, theme, and characterization and build and show time, place, and personality. Also, students will improve social and communication skills and explore tactile intelligences*

LEGO Smart Colors

LEGO Smart Activity

By Daniel Ilkov, Landscape Architect

Explain the kids and students what are Neutral, Cool, and Warm colors. Then ask them separate the LEGO bricks from Lego Smart Kit by colors. There are Neutral (white, black, grey varieties, pink), Cool (blue, green varieties), and Warm (yellow, red, orange, pink) colors in it. Then take the pink 1x1 brick and add it to the Cool, and then to the Warm colors. It is actually suitable to all the colors. Depending on the surroundings, some colors became cool or warm.

Lesson Learned: *Tonality, Colors, depending on the surroundings, some colors became cool or warm.*

My LEGO! My LEGO?

LEGO Smart Creativity Contest Entry

By Maggie Labinski, Loyola University Chicago

Each student will create a self-designed 'possession' from the LEGO Smart Kit. They will be charged to keep this 'object' with them at all times for the course of a week and journal their thoughts and reflections about the experience. Possible reflection topics may include: In contrast to other 'things' I carry with me at all times (such as cell phones) do I find this 'thing' more or less difficult to keep with me? In what ways do I find my 'possession' liberating? In what ways do I find it stifling? What do my friends and family members think about my new 'object'? How does this 'possession' change the way I view other 'things' of mine? The project will conclude with a round-table discussion of the student's journals. At that time, those who find themselves less than 'attached' to their new 'objects' will be invited to dismantle and leave them behind.

Lesson Learned: *Today's modern world affords those of luxury a great many material possessions. However, more often than not, the speed with which we might 'build and buy' such 'things' outpaces the time necessary to answer the pertinent questions hidden behind all acts of ownership: What is my relationship to this 'object?' What sacrifices am I willing to make in order to 'keep' it as my own? How does my ownership positively and negatively alter my relationships to others? The goal of this activity is to encourage students, alongside close-readings of several social and political philosophers, to begin thinking about these kinds of questions, to begin thinking about their relationships to 'possessions.'*

LEGO Memory Expander

LEGO Smart Activity

By Corey Sekulow

One person builds anything they want out of LEGO bricks and shows it to the other person. The other person gets to look at it for 2-3 minutes, and then needs to replicate it without looking. How much can you remember?!

Lesson Learned: *increase short term memory*

Plato's LEGO: Philosophical Building Bricks

LEGO Smart Creativity Contest Entry

By Shane Ewegen, Boston College

By mapping the various parts of the city (and the human soul) onto LEGO bricks, a similar construction will be undertaken within the classroom. Students will be required to build a LEGO city that corresponds to the 'city in speech' described in Plato's Republic. The success of this city, and whether or not it will stand on its own, will depend upon the student's familiarity with the text. Reciprocally, the concrete exercise of building the LEGO city will reinforce an understanding of the text. Through this group-activity of building the 'philosophical city' the students will come to a greater appreciation of the text, of the art of political philosophy, and of themselves. Basic building strategies. The LEGO bricks will be labeled in such a way as to correspond to the parts

of the city (and the soul) discussed in Plato's Republic. Through arranging these bricks, certain structures (outlined by the professor in advance) will be constructed. These structures will in some way reinforce the lesson learned. (For example, a pyramidal structure will be made to correspond to the 'tri-part soul' discussed within the text.)

Lesson Learned: *In Plato's Republic, Socrates undertakes the construction of a 'city in speech' – a theoretical city the specifics of which reveal both the limitations of actual cities, as well as the arrangement of the human soul. Through an engaging and dramatic dialog between himself and two interlocutors, Socrates constructs this 'theoretical city' from the ground up, investigating and testing each element as it is set into place. Whether or not the finished product (i.e., the city) will stand on its own depends upon the way in which the parts are arranged.*

Lets Match Colors

LEGO Smart Creativity Contest Entry

By Beverly Caskey

Teaching children with learning disabilities can be a challenge, but using LEGO bricks and a toy

can help. Show students a red LEGO brick plus a fire truck matching those colors together with a small sign that has the letters R E D. Some children like to make up songs to go with the toys. This helps a child learn different colors associated with other things.

Lesson Learned: *Students will learn to match colors to other objects and about the colors of the rainbow.*

LEGO Bricks Are Universal

LEGO Smart Creativity Contest Entry

By Patricia Stine, Ranson Elementary School

The kindergarten students will be broken into groups of three. The groups will be both Spanish speaking and English speaking students. Together, they will duplicate a model built by the teacher. Then they will each have the opportunity to build a model and have their friends copy that model. The students will count the LEGO bricks used in both Spanish and English. They will present their models to the whole class, explaining how they build their models. The entire class will have the opportunity to build each others model.

Lesson Learned: *Even though we speak different languages, we can work together to create a project. We can use eye-hand coordination and enhance our fine-motor skills, which prepares us for writing. We can follow unspoken directions. WE can learn each others language.*

LEGOgistic Thinking

LEGO Smart Creativity Contest Entry

By Beth Pendley, Ware Shoals Elementary School

Students will be divided into groups of two. Students will then be given a detailed oral description of an object. This object could be a bird, a plane, a house, or abstract. Students will then work with their partner to create what they think the object should look like using the LEGO Smart Kit. Teacher will create objects ahead of time and must use all LEGO bricks given to the students. This is important because the teacher must give an exact description verbally to help students mentally visualize the item and construct it.

Lesson Learned: *Students will develop critical thinking skills through problem solving, as well as develop team working and leadership skills. Students will also strengthen there ability to follow oral directions and visualize and object based on an oral description.*

Landmarks

LEGO Smart Creativity Contest Entry

By Kimberly Wynns, Cambridge Academy

Students are to select a landmark they would like to construct. Estimate the scaled down size of the project. Create a scale. Use graph paper to re-create the LEGO landmark using a front, side, back and top image. Gather their LEGO pieces. Construct the landmark.

Lesson Learned: *Proportion and scale, 3d visualization*

LEGO Descript-O

LEGO Smart Creativity Contest Entry

LEGO Smart Creativity Contest Entry

By Michele Dechman, Cross Creek Elementary

In this activity students work in teams of 4 or 5 to create a unique architectural structure using LEGO bricks. After finished, a picture of the group's structure will be taken. Teams will then incorporate descriptive and informative writing skills to specifically explain how they built their structure from start to finish. Once the architecture design process has been documented on paper and proofed by the group, the structure is then taken apart by the group. The group will then rotate around to another groups descriptive and informative writing to try to re-create the previous groups architecture structure. The group that can duplicate the original structure's design perfectly will win a classroom prize!!! In addition, the group that designed the structure in the first place will also get the classroom reward because that meant they had awesome descriptive and informative writing skills to lead the other group to LEGO-Descript-O SUCCESS!!!

Lesson Learned: *Students will use collaborative planning, descriptive and informative writing, and team building skills to create a LEGO architectural masterpiece.*

LEGO My Essay

LEGO Smart Creativity Contest Entry

By Tiffany Lange, East Paulding High School

Students pair up and each group gets 10 LEGO bricks. They have 5 minutes to work together to build any structure they can. They have to share their structure with the class, along with how they built the structure. Then we go over the writing process. Each student writes a comparative essay on building with LEGO bricks and how it compares to the writing process.

Lesson Learned: *Students apply the building process to the writing process.*

Create Awesome Transportation Vehicles

LEGO Smart Creativity Contest

By Susan Micco, Euclid Lutheran Child Enrichment Center

Set out large box of LEGO bricks and asked the children to create a machine that could fly or drive any where they wanted to go.

Lesson Learned: *Using their imagination to create Earth and space travel machines. Working together and sharing the pieces while creating. Piecing together colors and sizes to create a machine including people pieces fitted in to drive or fly them.*

Lets Enjoy Grammar Organization

LEGO Smart Creativity Contest Entry

By Maureen Marino, John L. Golden Elementary

Directions: Make a chart to show that the LEGO brick colors represent the following parts of

speech: 1. Black prism: upper case letter at the beginning of the sentence 2. Tall black brick: exclamation mark 3. Light green square: question mark 4. Single pink brick: period 5. Dark blue: subject/nouns/pronouns 6. Dark green: predicate/verb 7. Yellow: adverbial phrases (why/where/when/how) 8. Orange: adjective 9. Red: articles (the/a/am) 10. White: conjunctions (and/or/nor/but) 11. Gray: question word/phrase and transitions with a comma Demonstrate a sentence to the students by arranging the colored blocks in a vertical line according to the "color code" listed above. (An example of this would be: 1, 9, 8, 5, 6, 7, 4.) Tell the students a

sentence that could be made by using the color codes on the LEGO bricks. (An example of this would be: A fat cat purred when she was petted by her owner.) Ask the students to write their own sentence using the same format. Allow the students to volunteer to share their sentences. Repeat this guided activity three more times. Allow the students to work in partners to arrange the LEGO bricks and write their own sentences. Ask the students to record two of their favorite sentences and brick combinations on a piece of paper for assessment of knowledge. This activity should be played on a regular basis to encourage language arts exploration and growth.

Lesson Learned: *Students will use creative problem solving to decode sentences. They will demonstrate perseverance while designing their own LEGO creation sentences. The children will use teamwork to communicate ideas and plan, organize, and design new sentences. This activity will encourage independent thinking while engaging the students in language arts exploration.*

Building A Feeling

LEGO Smart Creativity Contest Entry

By Olufunke Olise, Inter-tribal Nation School

Each student selects a color or colors of LEGO bricks that represent their feeling(s). They assemble the bricks to be an outward expression of that feeling. They share the feeling and explain why. The class thanks them before they go to sit down. Each child gets thanked at the end of their explanation. No other comments are allowed. The goal is to identify feelings, express them, and be validated/learn to validate others.

Lesson Learned: *The children learn to look inside themselves and identify their feelings. They then build an outward expression of that feeling and share it with the class.*

Hide Bricks

LEGO Smart Creativity Contest Entry

By Dave Parker, Welmar Hills School

Using all of the parts from the LEGO Smart Kit, build a structure that hides some of the parts completely from view from the outside, even when the structure is picked up and examined from all angles. How many parts can you hide completely from view? Start by trying to hide one part. Then try two parts. How far can you get?

Lesson Learned: *When solving an open-ended problem, it is often a good idea to start with a simple goal, then increase your goals a little at a time. However, you will also find that following an "incremental" approach such as this may only get you so far, then to get farther you may need to step back, think "out of the box", and start over with a completely different approach.*

All Lit Up

LEGO Smart Creativity Contest Entry

By Kelly Hines, Chocowinity Primary School

In this activity, students will build scale models of one of the lighthouses along the Cape Hatteras National Seashore using LEGO bricks. They will do independent research on the heights, circumferences, etc. of the various lighthouses of North Carolina. Using their research, students will recreate scale representations of each of the lighthouses. They will also build an electrical circuit, with a working switch, that will light up their replica lighthouse for sharing

within the school community. In order to do this, students will use wire, a basic switch, a small bulb and bulb holder.

Lesson Learned: 4th grade students in North Carolina study both local history and electricity and magnetism. Students will focus on mathematics (scale representation), collaboration (by working in groups), history (by researching local lighthouses), and science (building a working circuit).

The Weird Duckbill Platypus

LEGO Smart Creativity Contest Entry

By Melanie Colon, Home School

Start by putting the lime green LEGO plate on the bottom. Next, layer the bricks on top of each other. The blue 16 stud brick, on top the black 12 stud brick shifted to the back. Then, the back half are the two yellow bricks, four and eight stud, the gray 12 stud brick, the green 12 stud brick, the orange eight stud brick, the skinny six blue stud brick on the right and the skinny green four stud brick on the left. In the front half is the orange four stud brick, with the two thin red bricks coming out as the beak with the black slanted brick on the protruding part with the gray six stud brick on it. In between is the thin white brick with the eye on top and the two stud yellow brick and green brick together to fill the space above the eye.

Lesson Learned: The student worked on her hand-eye coordination. Then being a student in speech therapy, verbally communicated what had been built. Putting the pieces together to form an odd looking Duckbill platypus.

Where The Wild Things Are

LEGO Smart Creativity Contest Entry

By Heather Peirce, Glencoe-Silver Lake Public School

Read the story-WHERE THE WILD THINGS ARE by Maurice Sendak. After the story present a team of two with the LEGO bricks for them to create their Wild creature. Have students write a description about their Wild creature and present it to the class. The class would then vote for their favorite creature which would be featured in the classroom newsletter.

Lesson Learned: The students will be able to use their imagination and create their own Wild creature using the LEGO bricks. They will recall what they heard in the story and work as a team to create a wild creature. They would work on their writing skills when describing their creature they created.

Learning How to Revise an Essay

LEGO Smart Creativity Contest Entry (JUNE WINNER!)

By Kacey Weiss, Helix Charter High School

Place a blank sheet of paper in front of each student (this is their place mat.) Then place a handful of LEGO bricks in front of each student. Tell students they have 5 minutes to create a masterpiece. After the 5 minutes is up, ask students to title their masterpiece and write the title on the placemat. Then tell them they have 2 minutes to "change" one thing about their piece. Have them write down on their paper how this improved the overall appearance of the piece. Then tell them to "move" a LEGO brick or cluster bricks. (one minute). Write down the change. Now give them one minute to "remove" a LEGO brick or cluster of bricks. Write down the

change. Next have students explain to their partner the process of building a masterpiece. Connect this to the art of drafting a paper (moving pieces, removing pieces, changing pieces). Note that we never took the whole masterpiece apart; we simply made it nicer.

Lesson Learned: *Students will learn how to revise an essay and the difference between "re-doing" and "revising."*

LEGO and 3D Animation Modeling

LEGO Smart Creativity Contest Entry

By Kirsten Konopaski, Bay Path Regional Vocational Technical High School

Work in teams of two. Take the LEGO Smart Kit and create something...anything! You should use at least 10 of the pieces. Try to build something that is meaningful. Give it a name. Using Carnegie & Mellon University's Alice software environment to create your object using other objects that Alice provides. Your model should represent each individual LEGO element that makes up your creation. Your object should be scaled to size for each individual LEGO element that makes up your creation. Your object should represent the color of each individual LEGO element that makes up your creation. Create a method to rotate your object vertically and horizontally in 3D space. Create a method that changes the color of your entire object to one solid color.

Lesson Learned: *Teamwork, 3D Modeling with Animation, Object Oriented Software Design*

Binary LEGO Game

LEGO Smart Creativity Contest Entry

By Kirsten Konopaski, Bay Path Regional Vocational Technical High School

Materials: 20 piece Lego Smart Kit, 1 pair of six sided dice, 24 toothpicks or tacks, scratch paper and a pencil

Setup: Turn each LEGO brick upside down. In teams of two, make sure that each player has 12 upside down (circular holes). Line them up left to right in a line. Rules: Take turns rolling the dice. For each roll perform the following calculation and then the binary translation: Determine the sum of the factorial of the two numbers rolled on the dice. Convert that decimal number to binary. Example: roll dice & get (6 & 2) Answer is: $6! + 2! = 722$ (in decimal) Converted is: 1011010010 (in binary) Represent the binary number by placing the tack or toothpick into each hole that represents a '1' and leaving it empty when it represents a '0'. The fastest correct answer wins.

Lesson Learned: *math skills*

LEGO Catapult Fun

LEGO Smart Creativity Contest Entry

By Gail Chapman, Luella High School

Tell the students that today they will be making a catapult! Ask them to take out one 2x4, two 2x2, both 2x6, the 1x6, the 1x4, the 2x8, both flat 2x4s, the flat 4x4 and the flat 2x6 LEGO bricks from their LEGO Smart Kits (then promptly take a breather). To begin, ask the students to take the 1x8 and the 2x6 bricks and line them up long ways with a quarter of the 1x8 being in the middle (the rest being open space). Using one of the 4x2 bricks, connect all three of the pieces together on the bottom; using the 1x6 brick to connect them on the top. Tell the students

that this is the launcher. Connect one of the 2x2 bricks to the center bottom of the launcher. Now connect the flat 2x6 to a quarter of the far end of the launcher (the 2x8 end). On top of the remaining spaces of the flat 2x6 add a 2x2 first followed by the 2x4. Finally connect the 1x4 to either end of the flat 4x4; tell the students "that it is your launch pad!" Now comes the fun. Instruct the students to pull out the small pink block from the kit and tell them to place it on the launch pad (that is their ammunition). Now tell the students to make guesses as to where the best place for the launch pad would be along the arm of the launcher. Then let them experiment and learn for themselves (make sure to tell them not to aim at any other students!). Close the lesson with an explanation of torque and the students will never forget this fun physics concept.

Lesson Learned: *Students will learn about torque and how it relates to arm length with the use of a Lego catapult. It will introduce students to the idea that there are certain physical properties that govern how the world functions.*

LEGO Lexicon

LEGO Smart Creativity Contest Entry

By Todd Thuma, Indian River State College

The purpose of this activity is for students to define a language or lexicon for a set number of elements in their LEGO Smart Kit. They will then teach this language or Lexicon to 2 other groups.

1. Divide the students into groups of three students each and dispense a kit to each group.
2. Explain to students that they must randomly pick 10 LEGO bricks from the 20 bricks in their bag. Set aside the 10 bricks they do not select.
3. Students will construct a language to describe each element of the ten selected. Points will be awarded to each team based upon creativity, the ability of their chosen words to describe more than just one element, and the ability of their words to describe the other 10 pieces set aside.
4. Students must write this language or lexicon down into a dictionary type format.
5. After 20 minutes or so, student groups will visit another student group and each will teach their language or lexicon to the group using the bricks they chose and the visiting group's bricks. Points will be awarded to each group for learning the other group's language.
6. After 20 minutes or so, the groups will switch and visit a second group to explore the other group's language and teach their own language.
7. After another 20 minutes, the class will discuss each other's language or lexicon for the LEGO bricks and discuss in group the differences and similarities of each language. What influences did they have in developing their language? Did culture influence their choice of words to use for each element? What parallels can they draw with foreign languages? Is there one language more descriptive than another? Did anyone have any difficulty with another group's language?

Lesson Learned: *Language and slang is an important aspect of a child's education. Children will learn about language, slang and culture through this activity as they work together to develop a lexicon for the LEGO Elements included in there LEGO Smart Kit.*

Cell Activity

LEGO Smart Creativity Contest

By Cyndi Stone, Fort Walton Beach High

Each group (2-4 students per group) should receive identical sets of 10-30 LEGO bricks and a baseplate. Instruct each group to use all LEGO elements to build something creative that must have a name and a job or purpose. All pieces must be used. The LEGO bricks do not have

to be used for their intended function. Students will determine that each group had the same pieces to begin with, but each group built something that had a different function and name. This is similar to the way cells behave.

Lesson Learned: *Students will understand the concept that cells may have different functions(jobs) although each cell is made of the same components (LEGO elements). They will learn cooperatively in small groups.*

Character Creation for Literature

LEGO Smart Creativity Contest Entry

By Ivey Dietz, Homeschool

The teacher reads out loud a story book full of great characters. The story can be any book that the teacher already has planned to read to the class that day. As the teacher is reading the book the children are allowed to build with their bricks from the LEGO Smart kit. They are to create one of the characters that is from the book. At the end of the story the teacher has each child explain their creation and the character it was based on.

Lesson Learned: *Creativity and listening skills are developed as the child creates what he hears from the teacher as she reads. Then public speaking skills are learned at the close of the project.*

Critical Thinking Math

LEGO Smart Creativity Contest Entry

By Ivey Dietz, Homeschool

Break into groups of two. Have the students use both of their LEGO Smart Kits to create a rectangular shaped solid tower using all of the bricks in both kits. The trick is that they cannot have any of the same color brick touching another brick of that color.

Lesson Learned: *Team work, problem solving, geometry, and critical thinking are all used in this challenge of LEGO Smart.*

Catapult

LEGO Smart Creativity Contest Entry

By Nicole Dougal, Riversprings Charter School

The activity is to build a catapult and then experiment sending different LEGO bricks soaring. Start by explaining what a lever is and how it works, including what a fulcrum is. The detail can be age specific and can go into details such as force and $F=MA$ or it can be very basic. LEGO bricks can also be combined to drop from various heights to send other LEGO bricks into the air.

An example catapult has a base with the fulcrum and a lever arm. For the base you will need two 2x6 LEGO bricks, one 2x8 LEGO brick, one 4x4 flat LEGO brick, one 1x6 LEGO brick, and one angled 2x4 LEGO brick. Start with the 2x8 brick and place one 2x6 on either side so that there are three even flat sides and the 2x8 is sticking out of the bottom. Then the 4x4 flat brick attaches to the tops of these three pieces being centered on the sides and flush with the top of the base. Next the 1x6 brick attaches to the far right side, on the 2x6 brick. Last the angled piece attaches to the top of the 4x4 flat brick even with the top left corner. There should be a space between the angled piece and the left hand 2x6 brick.

For the lever arm you will need the rest of the flat bricks (there should be four) and the 1x4

LEGO brick. The attachments are unconventional for some LEGO users. Start with the 2x6 flat brick and the 2x3 flat brick. Place the 2x6 brick down and insert the 2x3 brick at a 90 degree angle lengthwise in-between the last two sets of knobs so that the pieces are perpendicular to one another. The knobs on the 2x3 flat brick should face away from the center of the 2x6 brick. Now attach the 2x2 and the 2x4 to the 2x3 in a similar manner with the 2x4 on top, in-between the middle and top knobs, with the 2x4's knobs facing downward. The 2x2 brick is attached in-between the middle and bottom knobs, with it's knobs facing up. Last the 1x4 brick is turned upside down and attached to the far end of the 2x4 flat brick. This should cause the lever end to be top heavy and fall back to the side of the 1x4 brick. The 2x4 flat brick and the 1x4 brick form the cup that will hold the other LEGO bricks that will soon be flying and the 2x6 brick is the arm that we will force down. The angled piece is the fulcrum. The lever arm should fit in the base almost as if cradled. It will sit at about a 30 degree angle. Make sure the angled piece is angled inward such that the 2x6 flat brick of the lever arm is against the angled surface and the cup is resting against the 1x6 brick. Now we are ready to go.

Place a LEGO brick in the cup and fire away! The bottom of the 2x8 brick that is sticking out forms a great place to hold or secure the base so that it does not go flying, though the lever arm most likely will fly as well, though not as far as the LEGO brick in the cup. Try different sized LEGO bricks, or combine them. You can also combine the left over pieces and drop them on the lever arm to send the other LEGO bricks flying. Your students will love it. Remember to reinforce what you talked about earlier. Showing them where the lever and fulcrum are on their model and discussing the results of their different experiments (i.e. the different results they get with different amounts of force, heavier LEGO bricks, etc.).

Lesson Learned: *Student will learn basic mechanics including levers, fulcrums, distance, force, etc.*

L.E.G.O. - Let's Estimate Geometric Objects!

LEGO Smart Activity *(Does not use LEGO Smart Kit)*

By Elizabeth Carpenter, Chittenango High School

Prepare: Place about 20 LEGO bricks into a sandwich bag. Avoid using wheels. Do use odd shapes appropriate for age level. Prepare enough bags for one bag for every two to three students.

Activity: Introduce the activity by discussing estimations. Tell the groups they can mass any one LEGO on the digital balance and they must tell you the mass of the entire bag of LEGO bricks. Groups should first decide which LEGO brick might be the "best". Once they have

massed the selected brick, they should create a data sheet tabulating all of their LEGO bricks including the masses they estimate for each brick and the total mass of all the LEGO bricks.

Options for activity extension: Have students write a discussion of the technique they used for determining the total mass. Have students calculate percent error. Have students write a discussion of why they were "off" on their measurements. Have students write a discussion of how they could improve the final measurement by massing one more LEGO brick. Have a class contest for the group with the lowest percent error. Build a large LEGO object or use a picture and ask students to write how they could determine the mass of the object from the mass of a smaller object. (Density idea, volume concepts.)

Lesson Learned: *Students learn how to problem solve, estimate, tabulate, and communicate as they work in groups to solve an estimation of "mass" problem.*

Algebra Alligator

LEGO Smart Creativity Contest Entry

By Becky Beyer, Granby Elementary Gifted Services

Students will work in small groups. The light gray LEGO brick equals 1 unit of volume. Using this brick as "x", students will express all other bricks in relation to x. For instance, the flat black 6x2 brick is expressed as $1/3x$. When they are done comparing and expressing volumes, students will make a shape that looks like an alligator. Then, they will decide what the volume of the alligator is, based on the light gray brick as one unit of volume.

Lesson Learned: *Students will explore the use of a variable when comparing volume.*

Constructing A City

LEGO Smart Creativity Contest Entry

By Rebecca Hite, Chapel Hill Carrboro City Schools

In this activity each team of students (3-4) will receive a package of LEGO bricks and a base plate. Students will first discuss what they feel are the central features of a city. What details are unique to these urban places? They should create a list and a rough sketch of their urban landscape. Students will then construct their city model using the bricks in the LEGO Smart Kit. Once completed, they will present their model to the class. In their group presentations, students should justify their selections within their model in additions to challenges they experienced within the activity. After presentations, they will compare their models to existing

models of US urban development to compare and contrast between the models. Students will debate if these models are adequate representations of reality.

Lesson Learned: *Students will use inquiry to design a typical city landscape using LEGO bricks. They will work in teams using their prior knowledge to construct a typical American urban landscape prior to their unit on Urbanization and Cities. (AP Human Geography Curriculum.) Through this engaging methodology of modeling, students will derive the essential components of an urban/city landscape (Central Business District, Zoning, Symbolic features) and then compare them to determine how they reflect various city models of US cities (Concentric Zone Model, Multiple Nuclei model, and Sector Model).*

Mythological LEGO

LEGO Smart Creativity Contest Entry

By Julie Wille, Aspen Elementary School

Give students ample time to free build a mythological creature. Students should be asked to use their imaginations to create a creature with various powers, depending on the LEGO bricks used and the attributes assigned. Creatures may be animal like or a mix of person and machine. Students will then be asked to write a description of the character. Teams of students will be formed and given the task of creating a game where the characters are integrated. Creating a game with other students.

Lesson Learned: *Creative play Applied imagination Writing a character description*

Pattern Recognition

LEGO Smart Creativity Contest Entry

By Lara Chartier, Homeschool

Use any 10 LEGO bricks from the LEGO Smart Kit. Child A creates something on a paper plate. Passes it to child B to study for 1 minute. Child A is given back the plate and Child B is asked to turn around. While Child B is not looking, Child A will remove one brick from his creation. When complete, Child A will hand the plate back to Child B. Child B must figure out which block is missing.

Lesson Learned: *Pattern recognition*

LEGO Character and Autodesk Inventor

LEGO Smart Creativity Contest Entry

By James McWilliams, Osbourn Park High School

Create a person or animal using the LEGO Smart Kit. Measure each part with a digital or analog caliper. Model each part and assemble the character using Inventor software. Create a presentation showing proper alignment of parts. Create a video of the presentation.

Lesson Learned: *To learn how to measure with a caliper. To create models using Inventor software.*

Creature Classsify

LEGO Smart Creativity Contest Entry

By Kelly Clark, Homeschool

After studying classification of vertebrates, use this activity for further understanding. Teacher should prepare a graph beforehand with columns labeled with classes of vertebrates. Give each student a LEGO Smart Kit. Ask each student to make an animal that would fit into one of the classes of vertebrates (mammals, birds, fish, reptiles, amphibians). As students show and tell what animal they made, they tell what class the animal fit into, and each student colors in a corresponding space on the graph to represent his animal. Discuss results.

Lesson Learned: *Students learn creativity and expression through building, classification of vertebrates, and graphing.*

Put The Art In LEGO Smart!

LEGO Smart Creativity Contest Entry

By Krisa Shook

All children will learn that their solutions will be different than their neighbor's -- but that is what makes each of them and their art unique.

For Older Children

Introduction to Picasso:

http://www.mykidsart.com.au/Pablo_Picasso_Famous_Artists_My_Kids_Art.html

Discus that: In cubist artworks, objects are broken up, analyzed, and re-assembled in an abstracted form—instead of depicting objects from one viewpoint, the artist depicts the subject

from a multitude of viewpoints to represent the subject in a greater context. Often the surfaces intersect at seemingly random angles, removing a coherent sense of depth. The background and object planes inter-penetrate one another to create the shallow ambiguous space, one of

object planes inter-penetrate one another to create the shallow ambiguous space, one of cubism's distinct characteristics. Cubism. Wikipedia, The Free Encyclopedia. 6 May 2009, 18:55 UTC. 7 May 2009 <<http://en.wikipedia.org/w/index.php?title=Cubism&oldid=288319735>>.

Challenge: Create a LEGO "picture" in the Cubism style (not a mosaic). Hint -- Basically, for this project they will break up their picture into geometric shapes that correspond to the LEGO bricks included in the kit. The picture can either be in their head or they may need to draw it first. Suggest that the colors do not have to be lifelike by discussing Picasso's Blue and Rose periods.

Suggestions: Face, Landscape, Ship on Water, Animals You may want to wait until after they are done the project before showing the pictures – unless they have no idea where to start. Discuss how each artist sees things differently, so more than likely, their project won't look like their friend's. After they understand this concept – look at everyone's finished projects are some the same? If so why might that be? Same pieces, discussions prior to completing the work, worked in pairs... where they hampered or helped by the suggestions? Now discuss how during his cubist period Picasso worked side by side with his friend George Braque, both created work which was almost indistinguishable. "Cubism." EyeconArt. 7 May 2009 <<http://www.eyeconart.net/history/cubism.htm>> citation only, **website not suitable for children.**

Online Picasso project: http://www.colgate.com/app/Kids-World/US/Game_Picasso.cvsp

Additional Picasso lessons using traditional art supplies:

<http://www.princetonol.com/groups/iad/Files/picasso.htm>

<http://www.artprojectsforkids.org/2008/03/tinted-and-shaded-self-portrait.html>,

<http://www.crayola.com/lesson-plans/detail/shaping-up-with-picasso-lesson-plan/>,

<http://www.matisse-picasso.com/education/>

For Younger Children

Introduction to Piet Mondrian: <http://www.enchantedlearning.com/artists/mondrian/>

Background for teacher on Piet Mondrian: <http://paintings.name/piet-mondrian-biography.php>

Challenge – make a piece of art in the style of Piet Mondrian who was inspired by Picasso's cubism.

Suggestions: Use as many or as few LEGO bricks to make a rectangle shaped artwork (one layer or two) Use all of the fat bricks (excluding the black slanted piece) to make a rectangle shaped piece of artwork Departure -- Use all the flat pieces to make a non symmetrical artwork

Online Mondrian project: <http://www.enchantedlearning.com/cgi-bin/paint/nQ/artists/mondrian/coloring/matrix.shtml>

Online Mondrian resources suitable for class viewing:

Piet Mondrian Animation <http://www.youtube.com/watch?v=R085NSLcDrc>

Piet Mondrian - A Journey Through Modern Art <http://www.youtube.com/watch?v=9fmiKOOvLUo>

Timeline of select pieces: <http://www.ibiblio.org/wm/paint/auth/mondrian/>

Additional Mondrian Lessons using traditional art supplies:

<http://www.enchantedlearning.com/artists/mondrian/activity.shtml>

<http://www.storyboardtoys.com/gallery/Piet-Mondrian.htm>

<http://www.kinderart.com/painting/mondrian.shtml>

<http://www.crayola.com/lesson-plans/detail/modern-mondrian-lesson-plan/>

<http://www.kinderart.com/arhistory/abstract.shtml>

Younger children: <http://www.kinderart.com/painting/mondrian.shtml>

Older children: <http://www.artsandactivities.com/Media/itwks75pdf/A100638.pdf>

Lesson Learned: Older children will be introduced to Picasso and the art form of cubism.

Younger children will be introduced to Piet Mondrian's art work which was inspired by Picasso's cubism.

Topographical Maps

LEGO Smart Creativity Contest Entry (MAY WINNER!)

By Heidi Bradford, Ottumwa Community Schools

Choose any area of a topographical map using sites such as www.topozone.com or Arc GIS explorer using the topographical map layers. Student will build the area and use the LEGO bricks to show the different layers of elevation using a color coded system. Must include a scale, any man made or natural made features and a legend.

Lesson Learned: *How to read a topographical map and construct it into a 3-dimensional area.*

Creating A Usable Object

LEGO Smart Creativity Contest Entry

By Christy Ingram, Ingram Home School

The children were told they had to work together to come up with an idea of what they would like to build. After the ideas were given then they had to each vote on the final product to build. Each student was to given LEGO bricks to look at and as a group decide what should go where. The children came up with several good ideas using the kit. Robot, boat, airplane. An airplane was decided upon as our final project and was completed successfully using all bricks given.

Lesson Learned: *Team building skills, cooperation, hand eye coordination. Thinking skills. Trial and error of building a complete project together.*

Uno, Dos, Tres

LEGO Smart Creativity Contest Entry

By Susan Mercy

Using Spanish numbers one through 10, instruct students to select a specified number of LEGO bricks. Place a few LEGO bricks in front of the student and have him/her use Spanish numbers to tell you how many bricks he/she has. Advanced application: add in the use of Spanish colors, shapes, etc.

Lesson Learned: *Use LEGO bricks to practice Spanish language skills.*

Discover Day With LEGO

LEGO Smart Creativity Contest Entry

By Becky Ling, Creekside Middle School

Situation: You work for a manufacturing company that makes products that solves problems and makes life better for people. They are currently in a recession and need an amazing product to put their company back in the green.

Project: Your team must make a product the company can market. Your company has been struggling and your product could save them from financial ruin and it could make you rich.

Problem: You have limited supplies and little time to pull this together.

Supplies: One bag of LEGO bricks and a 3x5 card

Directions: Using the LEGO bricks, build a product that could help meet a household need, business need, or personal need/want. Use the 3x5" card to write down the name of your product, what it does, and the benefit of using this product.

Note to teacher: This is a great activity as part of an introduction to technology and manufacturing.

Lesson Learned: *Teamwork, engineering exploring, problem solving, marketing, concepts of technology and manufacturing.*

Communication Immigration

LEGO Smart Creativity Contest Entry

By Nancy Nichelson, Montgomery Elementary School/DeKalb County School System, Georgia

This activity is for partners. Your partner and you are given 15 minutes to create a model of a tool out of the LEGO bricks. You are then going to explain what the tool is used for. The catch is that you and your partner are not allowed to talk to one another. It must be a collaborative product. You may not write in language to one another either. You have no shared language. When time is up. You may use your language to explain the tool. Did you and your partner know what tool you were building and what it was used for? Ask if the students could imagine what the immigrants that were working in factories and other jobs in the early 1900's were like. Did you feel less intelligent? Now repeat this activity with a different partner and this time you can talk to one another. Discuss the differences between the two activities and how it might have effected the way immigrants were treated.

Lesson Learned: *Spoken language is an important part of communicating. Immigrants that were working with other immigrants of another language had difficulty expressing ideas to work together and were perceived as less intelligent and could not produce the best products they were capable of producing. Experience the frustrations of migrant workers.*

Name The Missing Brick

LEGO Smart Creativity Contest Entry

By Karen Hoeschau, Cleckler-Heald Elementary School

Working in pairs, each student will build, in secret, a structure with a given set of bricks. Each student displays his structure for the other to see simultaneously. They may observe each other's structures for one minute. Each student secretly removes one brick from his own structure. Again, they display their structures to each other. Each student determines which brick was removed by describing its attributes. This activity can become more challenging by adding more bricks or removing more than one brick each time.

Lesson Learned: *Students work on memory recall and descriptive vocabulary.*

Dot Challenge

LEGO Smart Creativity Contest Entry

By Jeni Kocher Zerphy, Homeschool

Students will work in groups of 2 or more to build a structure with the greatest number of visible dots. All LEGO bricks must be connecting in some fashion, no free floating bricks. Answers will

vary leading to great discussions. Groups will be challenged to increase their dot number the next time they meet. Students can use digital cameras to document their attempts or graph paper and colored pencils.

Lesson Learned: *Students work together, respecting each other's ideas, regarding how to build a structure with the greatest number of dots visible. Students will see how ideas build off of other's ideas to get closer to their goal as they test the various ideas.*

Mission To Mars

LEGO Smart Creativity Contest Entry

By Casey Keith, Metropolitan Montessori School

Using the materials given to you, design one of the spacecrafts, robots, etc. needed for humans to reach Mars and return to Earth safely.

Lesson Learned: *A mission to Mars is possible in the next fifty years, and it will require a number of machines to be engineered.*

Measuring

LEGO Smart Creativity Contest Entry

By Gwen Woolhouse, Madison Elementary School

Students will practice using a ruler to measure each LEGO brick to the nearest $\frac{1}{4}$ or $\frac{1}{2}$ inch. They will start by measuring all LEGO bricks in their bag. They can record the length of each LEGO brick on a chart. When all bricks are measured, they can be placed into groups according to size. Each student can then create problem solving questions for another partner to solve. For example, Which LEGO bricks measure greater than $1 \frac{1}{4}$ inch? When students have created their questions, they can get with their partner and take turns answering each others' questions. To finish the activity, challenge students to see who can connect their LEGO bricks end to end to make the longest chain of LEGO bricks. They can also stack their LEGO bricks on top of each other to create the tallest stack. Measure with a ruler to compare with other classmates.

Lesson Learned: *Students will learn measuring to the nearest $\frac{1}{4}$ and $\frac{1}{2}$ inch. This lesson will also incorporate problem solving, categorizing, cooperation, and numeration skills*

LEGO Stamp Art

LEGO Smart Creativity Contest Entry

By David Shircliff, Loudoun County Public Schools

Connect a 2x2 brick to the center of the 4x4 plate; this will be the base of the stamp. On the bottom of this assembly students can arrange bricks of the same height in different patterns. Then have the students press their "stamp" into some acrylic paint that has been brushed onto some scrap paper. Now they simply press the stamp on a clean sheet of paper to form patterns. Students can design their own Tessellations or try to match patterns others have created.

Lesson Learned: *Tessellations, reflection, rotation, and translation. Creativity and problem solving.*

Rectangular Prism II

LEGO Smart Creativity Contest Entry

By Carol Boyce

With a partner, build a 6x4x2 prism. Explain that by counting the number of studs in each level, that is the area of that level. Students chart their work. Review charts and show students how to add another column and row. Students will count the number of studs in each level of their prism. Pairs will chart their own results and share with the class. Using the group charts from Rectangular Prism, or start new ones; add another column: 'Area'. Add a 'Total' row. Record students' results. How many studs were in each level? What was the length of each level? What was the width? What would you get if you multiplied length times width? In each level, area is length (6) times width (4) which totals 24.

Lesson Learned: *Students will calculate the area of each level of their 6x4x2 prism. Students will discover that the area of each level will equal 24. Students will learn that area is length times width.*

Instructions

LEGO Smart Creativity Contest Entry

By Dave Diehl, Council Rock HS North

Students will design a process, then identify and communicate specific tasks needed to implement the process. Students will work in pairs. Students should face each other with a shield between the two in order to obscure the work area in front of each. One student (builder) should face away while the other (designer) creates a structure using at least 5 pieces of the LEGO Smart Kit. The structure is then placed on the work area, hidden from view of the other. The designer must then guide the builder through replicating the structure without visual cues; the builder may ask questions and the designer may answer specific questions as needed, however, the part must remain hidden, and the builder may not show the in-process piece until it is completed. Once the builder states the item is complete, the shield is lifted and the two pieces are compared. Effective communication is evaluated based on similarity of the two structures.

Lesson Learned: *(From the ITEA STL standards) Students will develop abilities to use and maintain technological products and systems.(Standard 12) Students will learn how to communicate with others through paired learning.*

Learning Anatomy with LEGO

LEGO Smart Creativity Contest Entry

by Beatrice Koubi

This is a great activity to help young minds learn the human anatomy! Young students build a LEGO person, one LEGO brick at a time. They request one LEGO brick from a pile of bricks by specifying the shape, size, color, and then telling how they will implement the brick into the creation of their LEGO person (arm, leg, head, etc.). Each child's LEGO person will look different. Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Lesson Learned: *My preschoolers used creativity, eye-hand coordination, patience by waiting their turn, respect by accepting others funny outcomes, verbal interaction by asking for shapes, colors sizes and body parts. We added another dimension to this activity by using the German word for each body part.*

Making A Robot

LEGO Smart Creativity Contest Entry

by Stacy Oakley, Latta After School

Choose a team of five. Draw robot to scale. Develop advertising skills by writing commercials for the robot. Build Team--apply design to the robot

Lesson Learned: *Team work skills, hand-eye coordination, mind creativity, entrepreneurial skills, applied math skills*

Read All Directions...

LEGO Smart Creativity Contest Entry

By Cynthia House, Thomas Middle School

We use a written form at the beginning of our seventh grade Industrial Technology rotations, a class which requires careful attention to following instructions. Unfortunately, too many students have seen this exercise already, dramatically reducing its impact. A hands-on, building version would probably not be recognized for what it is, and besides, its very appropriate for a lab class like Industrial Technology.

Each student will receive a LEGO Smart Kit and a sheet with these instructions:

Read all steps carefully before beginning. You will have five minutes to complete the task.

1. Remove the LEGO pieces from the bag.
2. Sort the pieces according to color.
3. Separate the gray, white, black and pink bricks. Set the other colors aside.
4. Stack these rectangular bricks in the following manner: 2 x 6 hub black on the bottom, then the 2 x 3 hub gray, 2 x 6 hub gray, 2 x 2 hub white, and the pink brick.
5. Arrange the remaining color bricks in rainbow order beginning with red on the left and ending with blue on the right.
6. Stand up and say loudly, "I am LEGO Smart!"
7. Use any nine bricks of the same thickness from the rainbow colored bricks to form an 8x8 hub square.
8. Place the stack assembled in step 4 onto the square made in step 7. Place it so that all bricks in the square but one are locked in place.
9. Use the thin red 2x3 hub brick to lock the loose brick in the 8x8 square in place.
10. Place the thin, light green 4x4 hub brick onto the pink brick.
11. Place the thin 2x4 hub red brick onto the light green brick. Overlap only 4 hubs.
12. Attach the remaining bricks anywhere you please.
13. Disregard steps 1-12 above. Take out only the yellow and red bricks. Build a model of a duck."

After five minutes stop the class. Ask a student to read step 13 aloud.

Lesson Learned: *This is a modification of the old following directions written exercise in which students are told to read all the directions before beginning a long list of tasks. The final task is to ignore all the preceding tasks.*

The Shape Game

LEGO Smart Kit Activity

By Daniel Ilkov, Landscape Architect

Separate all LEGO system bricks from the plates, slopes, and other LEGO Smart Kit elements. Set the blue 8x2 brick apart from the other bricks. Using the remaining bricks, copy the shape of the 8x2 brick. Example: Use two 4x2 bricks. How many different ways are there to make this shape? (There are 66 different possibilities in all!)

Lesson Learned: *Students learn shape configuration, creative-thinking, and problem-solving.*

Create 9

LEGO Smart Kit Activity

By Daniel Ilkov, Landscape Architect

Create nine different sized squares from the LEGO bricks within the kit. Assemble the bricks without attaching them. The first would be 1x1. The second would be a 2x2. The third would be a 3x3. The largest square is a 9x9. Once you have the 9x9 square completed you have an excellent (and fun) math chart to assist with addition, subtraction, and multiplication.

Lesson Learned: *Students will learn basic math and shape skills.*

Create A Balance

LEGO Smart Creativity Contest Entry

By Ferial Khan, Homeschool

Place the #1 pink LEGO brick under, and in the middle of, the large blue #16 LEGO brick. Attach the orange and yellow #8 LEGO bricks on either side and on the top of the blue brick, making sure that their long axis is the same as that of the blue brick. The orange and yellow LEGO bricks must each be connected to the last 4 connecting studs of the blue brick so that they

project beyond the blue brick. Then, on top of the yellow and orange LEGO bricks place the green and gray #12 LEGO bricks onto the last 2 connecting studs to the outer edge, in a perpendicular arrangement. Now use the balance to see which of the remaining LEGO bricks, or combination of bricks weigh the same or not. Essentially, the pink brick acts as the anvil of the 'see-saw'-like balance.

Lesson Learned: *The aim of this activity is to develop an understanding of how a simple balance works. A "seesaw"-like balance is constructed and used to compare the weights of remaining LEGO bricks.*

Proportion

LEGO Smart Creativity Contest Entry

By Christine Guest, Homeschool

What do the orange and yellow 2x2 LEGO bricks, the white LEGO plate, the green LEGO plate, and the pink LEGO brick all have in common? There are lots of right answers, but they are all squares. Look at the fractions $\frac{2}{2}$, $\frac{1}{1}$, and $\frac{4}{4}$. If you simplify those fractions, what do you get? Compare a 2x4 LEGO brick and a 1x2 LEGO brick. Are they in proportion like the squares were? How about the 1x4 and 2x8? How do you know they are in proportion?

Lesson Learned: *Similar shapes look similar, even if they are at different scales. You can count the studs on your LEGO bricks to help you figure out scale.*

LEGO Simon Says

LEGO Smart Creativity Contest Entry

By Kim and Justin Thompson, Homeschool

Two to three players are needed (with one being "Simon"). The educator starts out as "Simon" and gives commands to the other players using the "Simon Says" model (e.g. "Simon says, attach a yellow LEGO brick to a blue LEGO brick..."). The directives can start out easily and build in complexity; however, the player must hear "Simon Says" in order to complete the task. If the educator says, "Put a red LEGO brick on a blue LEGO brick" (without saying "Simon Says") and the player does the directive anyway, the game has ended and it's another player's turn to be "Simon." Educators and players can get really creative in building different shapes, animals, structures, and so on. Simple and fun!

Lesson Learned: *listening skills, color/shape/texture recognition, building creativity, taking turns, good sportsmanship*

Start Where You Area. Use What You Have. Do What You Can.

LEGO Smart Creativity Contest Entry

By Taylor Penrose

Create a boat... Gather the class together for this project. Discuss how the class might build a boat. By using all the bricks in your LEGO Smart Kit... Now that you have your plan, no talking or alterations allowed. (5 minutes) Have one student start this project and pass it around. The students will take a brick and place their brick on the existing model, remember no alterations or talking allowed! Play completes when all the bricks have been used. (10 minutes) Discuss the project. (no negative feedback)

Lesson Learned: *The value of talking about a plan of action prior to implementation. The importance of active listening and remembering what was discussed. Communication, team building, and creativity are used in this project.*

Gray Scale

LEGO Smart Creativity Contest Entry

By Christine Guest, homeschool

Take out the white, black and gray LEGO bricks. Arrange them from darkest to lightest. You just make a gray scale. Now compare the colored LEGO bricks to your scale. Which ones are as intense as the black? Are any as pale as the white? Which gray is as intense as the pink or light green? Look at a black and white photo. How many shades of gray are used? How would a dog see your LEGO bricks?

Lesson Learned: *We can organize tints and shades by thinking of them on a gray scale. This is helpful when planning an art project, painting a room, or choosing elements of a craft project.*

Loompas In LEGO Land

LEGO Smart Creativity Contest Entry

By Audrey Wood, Arcadia Central School

This activity can be implemented into a reading curriculum as the class reads *Charlie and the Chocolate Factory* by Ronald Dahl. After being introduced to the Oompa-Loompas, the teacher may facilitate a class discussion on the survival of this species in their native land. A brief review of science content related to food chains, herbivores, carnivores, omnivores, predator/prey relationships, ecosystems, habitats, adaptations, etc. may be necessary. The teacher then distributes LEGO Smart Kits to students and instructs them to create a creature that inhabits LEGO Land with the Oompa Loompas. After creating the organism, students are responsible to name it and develop an encyclopedia entry detailing the appearance, habitat, physical and behavioral adaptations, natural enemies, eating and sleeping habits, etc. of the creature. After approximately 30 minutes, the group reassembles in one area of the classroom and each child shares his/her LEGO Creature and corresponding Encyclopedia description. A discussion may be generated about how these individual species interact in the Lego environment with each other and the Oompa Loompas.

Lesson Learned: *Students learn to connect classic literature to science through a higher-level thinking activity. Students communicate their creative designs with classmates via a written encyclopedia entry. The class then strengthens team building skills by working together to discuss the interaction between individual creature species.*

From Cell to Ecosystem

LEGO Smart Creativity Contest Entry (APRIL WINNER!)

By Vickie Myott, Argyle Central School

Prior to activity, teach students about how cells combine to make tissues and tissues combine to make organs and organs combine to make organ systems and organ systems work together to make an organism and the same organisms living together make a population and different populations live together to make a community and communities have abiotic factors included to make an ecosystem.

Students will begin with their own set of LEGO bricks. They will place one LEGO of their choice on the table in front of them to represent a cell. Then they will add a piece or two of the same color brick to form a tissue. Next they will join another student and connect their two "tissues" to form an "organ." This partner group will join with another partner group to connect their "organs" to form an organ system. This continues as more groups of students come together with their parts to form the next larger construction. The goal is to get to an ecosystem with the whole class having their original parts included in the final construction. Note: You will need to know exactly what bricks belong in each kit in order to take it apart and put it away.

Lesson Learned: *Reinforces the concept of starting out with a small cell and building up to an ecosystem. Promotes cooperation and team building.*

Feel The Frustration

LEGO Smart Creativity Contest Entry

By Patrick DiCaprio, Queensbury Elementary School

Start with an assembled LEGO piece that is not shown to the students. Then blindfold the students and have them feel the pre-made assembled piece. Once the student feels the assembled piece to their liking they are then asked to assemble their own LEGO piece as a replica of the one they just felt. They must remain blindfolded for this process. Once they feel

they are done, have them remove their blindfold and see how accurate they were with their own assembled piece.

Lesson Learned: *Through the sense of touch, students develop a keener awareness of feeling and replicating that feeling through manipulation of the LEGO bricks.*

Inferencing

LEGO Smart Creativity Contest Entry

By Kyle Gannon, Queensbury School

Ask your students what can you infer from looking at your LEGO bricks? Examples might be...that there were a lot of bricks, there weren't many of the same color, the bricks can be a figure. What conclusions do you draw? Examples....That the LEGO bricks can be color coordinated. That the bricks can go into sequential order.

Place the bricks into sequential order by the amount of pieces from each color. Create an animal from the bricks in sequential order. You must use all of the bricks by placing them on top of each other vertically. Write a creative story about the animal you designed. The students should include the animals habitat, diet, description of the animal, and ability to move fast or slow.

Lesson Learned: *That students will be able to infer, sequence items and draw conclusions*

Area Building

LEGO Smart Creativity Contest Entry

By Geoff Bizan, Sillwater Elementary School

Rectangle- Using the fewest pieces/most LEGO bricks possible build a rectangle with an area of 36. Quadrilateral- Using the fewest/most LEGO bricks possible build a quadrilateral with an area of 64 or higher. Notes- LEGO bricks do not have to be connected together.

Lesson Learned: *Students will use their knowledge of Area and Shapes to build an object with a certain area using as many blocks as possible, as well as the fewest blocks possible.*

The Longest Distance Between Two Points

LEGO Smart Creativity Contest Entry

By John Goralski, Stillwater Elementary School

Place two plastic cups six inches apart. Ask students to build the longest bridge they can out of LEGO bricks between the two cups using only right angles. The bridge must sit flat on top of the cups.

Lesson Learned: *Students will learn how to balance an object on a fulcrum.*

Rectangular Prism

LEGO Smart Creativity Contest Entry

By Carol Boyce

Describe a rectangular prism. Show students how to make a 6x4x2 prism. Show students how to count and label LEGO pieces. Students explore building a 6x4x2 prism in pairs. Students chart number, color, number of studs, height, etc. (Example: 1, green, 12, 1) Discuss what the

different ways of building a 6x4x2 prism are. How many pieces did you use? How many ways are there? Who used the least? Etc.

Lesson Learned: *Students will explore building rectangular prisms. Students will discover that there are different ways to make a 6x4x2 rectangular prism.*

Do You See What I See?

LEGO Smart Creativity Contest Entry

By Heather St. Clair

Begin by sitting two students (Student A and Student B) back to back with identical sets of LEGO bricks in front of each child. One student (Student A) will have 5 minutes to create a structure using their LEGO bricks. The other student (Student B) may not look at their structure during this 5 minute period! When the 5 minutes is up, Student A must try to accurately describe their structure to Student B. Student A must then give step-by-step instructions for Student B to follow in order to try and re-create Student A's design. When they believe they are finished, the students will work together to compare the two structures and determine how accurately the directions were given/followed, and what they could do to improve the process and product. The entire activity may be repeated with the same teams in order to facilitate vocabulary development, and determine if the finished products are more accurate in their second (third, etc.) attempt.

Lesson Learned: *Through this activity students will reinforce their listening skills, hand-eye coordination, their ability to communicate clearly with others, vocabulary development, and their spatial awareness.*

Equal Shares

LEGO Smart Creativity Contest Entry

By Sherri MacLean, Sugar Creek Elementary

Read the story "The Doorbell Rang" by Pat Hutchins. In this story, the children equally share their cookies with different groups of children. Retell the story, using LEGO bricks as "cookies" and re-enact the story with the students. Working in pairs, give each pair of students a LEGO Smart Kit and ask the students to divide them into equal shares. Then ask students to design their own creations using their equal share of the LEGO bricks, and share these creations with the group.

Lesson Learned: *Math concept of Equal shares. Re-enacting a story. Communication. Hand-eye coordination. Cooperation.*

Building The Great Wall

LEGO Smart Creativity Contest Entry

By Deb Gedaro, East ES

Students will research and learn about the Great Wall of China through books and technology. I visited (and climbed!) the Great Wall and have other sources of information to share with them as well. Students will be given a set amount of LEGO bricks and will have to plan how they will build their portion of the Wall. Some portions contain "towers"; others are deteriorated and "missing" bricks. Thus, there will be gaps in the Wall. Each segment of the Wall will be unique (as it is in real life!) Problems encountered with the project will be discussed and solved by the students and if necessary with the class. When the Wall is completed, measure its length and

partners and if necessary with the class. When the wall is completed, measure its length and determine a scale of miles. A scale will be made and attached to the model. Comparisons of the length of the Great Wall to other distances (ie 4 times the distance from Maine to Florida) will be made to help the children conceptualize the magnitude of this undertaking and achievement by the Chinese. The Wall will be on display for other classes to view.

Lesson Learned: *Students will work with partners to build sections of the wall (which will enhance their collaboration skills). Once the wall is finished, students will measure the Wall to determine its equivalency in terms of inches and feet to miles.*

Center of Gravity

LEGO Smart Creativity Contest Entry

By Molly Bullington, Burton Center for Arts and Technology

Give each student a LEGO Smart Kit, minus the black "roof" piece, pink piece, and light green plate. Ask students to set aside the blue 1x6 piece then build a 2-unit wide beam that is unbalanced with the remaining pieces (i.e. it may have a tower on one end, etc). Then, using each 1x2 section of the LEGO brick as a unit, have students calculate the moment from one end of the beam. Divide the moment by the total number of LEGO units to find the distance from the end of the beam (or number of units from the end of the beam) where the center of gravity lies. Place the blue 1x6 LEGO upside down on the table, then "test" the center of gravity solution that you found by trying to balance the beam on the blue LEGO brick. If it balances, you got it right! If not, take another look at your calculations.

Lesson Learned: *Calculating moments, calculating center of gravity*

Angles of Elevation

LEGO Smart Creativity Contest Entry

By John Brandt, Reedsburg Area High School

The students will be asked to build 3 different "towers" each with a different height using the steps outlined below.

1. Build a tower out of LEGO bricks.
2. Go outside on a sunny day and find a spot where the tower casts a shadow.
3. Measure (in either inches or centimeters) both the tower and its shadow.
4. Use trigonometry (sine, cosine, or tangent) to find the angle of elevation of each tower's base to the position of the sun.

Lesson Learned: *How to find an angle of elevation using trigonometry through the use of LEGO manipulatives.*

LEGO Wordo!

LEGO Smart Creativity Contest Entry

By Judy Leddy Durham Elementary School

This is a vocabulary game using a 5x4 grid gameboard with the words LEGO written down the left and Wordo at the top. Teachers in any grade level use 20 words they are currently teaching in their curriculum. Students can play alone or on a team. The teacher calls out a definition of a word and the letters such as "W" and "E" in the column and row. The student writes the word in the blank. If the student gets it correct, he wins one of the 20 LEGO bricks in the LEGO Smart

Kit and places it on their board over the correct word. When all 20 words have been called, the student or team celebrates by building a LEGO Creativity Critter to share with the class.

Lesson Learned: *The lesson will reinforce current vocabulary in any core subject area. The lesson promotes motivation to learn new vocabulary and creativity by building with LEGO bricks.*

LEGO Kingdom

LEGO Smart Creativity Contest Entry

By Jason Collins, Nicholas J Begich Middle School

Each student gets their own LEGO Smart Kit and works with a partner. Students spread the pieces in front of them and then they have 30-60 seconds to organize the parts according to some trait. After the time, partners share their classification system with each other. Give time for them to discuss. Then, have them organize the pieces according to a different trait. Continue until they can't come up with anymore. Have students share their classification systems with the whole class. Some examples of systems include separating by color, thickness, material, studs on top, 1x bricks vs. 2x bricks, sides with prime numbers, sides with even numbers, squares vs. rectangles, trapezoidal shaped sides, etc.

Lesson Learned: *Order and classification are important for noting similarities and differences. Communicating with others helps with critical listening and speaking.*

Level-Headed

LEGO Smart Creativity Contest Entry

By Susan Gloor, Clearbrook Homeschool

Each piece of the LEGO Smart Kit is used in this activity that creates a creature that has an eye and nose on one end. The rest of the creature is to be arranged in such a way that it balances in all five directions, other than its nose. No more than two pieces can touch the table at one time when balanced. Even tougher, only one piece can touch the table on each side when balanced. This can take all day!

Lesson Learned: *To work with a team, or individually, to create a creature by using logic, physics, math, and/or trial and error to create balance.*

Musical (or Narrative) Form

LEGO Smart Creativity Contest Entry

By Jason Fitch, Estacada School District

Listen to a short piece of music (multiple times). Rondo form works well. (Or a folk story with recurring elements.) Discuss the different parts/motives (story elements), what they sound like and how they recur. Work with a partner to build a map of the piece with your LEGO set. Present your map to the group, explaining your choices for size, shape, color, etc.

Lesson Learned: *Abstract Reasoning, Musical (or Narrative) Form, Teamwork, Communication*

City Scapes

LEGO Smart Creativity Contest Entry

By Tanisha Wesby, Goodlettsville Elementary

Introduce the lesson by using a K-W-L chart. Have the learners state what they know about the city, what they want to know about the city, and when the lesson is complete have them state what they've learned.

Read the book *Tar Beach* by Faith Ringgold. Have the learners recall what they remember or heard in the story. Then have the learners discuss illustrations they saw in the book that remind them of the city. Pass pictures around to the students of various American Sky Scrapers. Explain how this sculpture is seen in the city. Have the learners discuss what characteristic traits they notice or discover about the Sky Scrapers.

Create a predictable chart titled, "A Sky Scraper has _____.(student's name). Post the predictable chart during the lesson unit. Introduce the students to the LEGO bricks and allow them to have free exploration and build whatever they like independently. Then have them share their structures with peers. Have them tell about the structure. Review the predictable chart by having the student read their individual sentence. Explain to the students that their job is to create a Sky Scraper. Have them review the characteristics of a Sky Scraper. Discuss with the students that their structure should have 3-4 characteristics mentioned on the predictable chart.

Once the learners have had time to complete their structures. Have the students place their creations in a small shoe box. Next, give the learners a sheet of paper measured to the size of the box they placed their creation in. Explain to the learners that they are going to create an illustration of a city. Have them use pencils to draw their illustrations and then outline their pictures with a black permanent marker. Demonstrate how to place their illustration inside the box for a permanent fixture. Then have the learners place their LEGO Sky Scraper on the flap of the box to create a shadow box of the city and their Sky Scraper. To close the unit refer back to the K-W-L chart to see if they learned what they wanted to learn and what exactly did they learn.

Lesson Learned: *The students will begin to understand the connection between math skills and real-world situations. Students will apply spatial sense to create a figure, create a diagram, recognize there are different methods to solve problems, model problems using tools such as manipulatives and sketches, and observe and predict how the weight of an object and its position affects balance. Students will also discuss careers in science and mathematics, follow two to three step directions, and work collaboratively to complete and final project. The students will create a oral language chart about their observations and discoveries.*

Flower

LEGO Smart Creativity Contest Entry

By Brittany Courtney

I built this model by piecing the LEGO bricks together using these instructions:

1. Organize the parts.
2. Make the stem, grass, and two leaves.
3. Make the middle of the flower.
4. Connect the base of the flower to the end of the stem.
5. Connect the petals to the base of the flower.
6. Move the petals to the place you want them to be of the flower.
7. Make sure it looks like a flower.

Lesson Learned: *How to build with LEGO bricks on the computer and put things together*

Fraction Strip

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Have the students draw a circle. Explain the idea of ratio or piece of the circle. Draw a line to split the circle in half. $1/2$ is the ratio. 2 halves $2/2$ represent the whole circle. In fact, for all subdivisions of a circle $3/3$ $4/4$, it is easier to talk about the least common fraction $1/1$ than all the other equivalent possibilities. Note that $1/1$ can be obtained by dividing the numerator (top) and denominator (bottom) by the same value (the identity property). Similarly, any fraction $1/2$ has many equivalent fractions that can be obtained by multiplying the numerator and denominator by the same value $2/4$ $3/6$ $4/8$ etc. Have the students select 1x1, two 1x2, 1x4 and 1x6. Stack them to form a fraction strip. 1x6. 1x4. 1x2 (2). 1x1 Have the students identify different equivalent fractions using the bricks and an accompanying circle drawing.

Lesson Learned: *Equivalent fractions, identity property*

Mean, Median, Mode

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Mean: Sum divided by N.

Median: Middle measure or average of two in the middle.

Mode: The measure that appears most often.

Range: Difference between highest and lowest measure.

Explain sorting into increasing order and why it is easier to find information in a sorted list (i.e. phone book). Have the students sort the LEGO bricks according to the longest side (or shortest) (or color) (or area) (or bottom circles). There are 20 bricks. Record the 20 values. Calculate the statistics. Ask the students for an interpretation of the results. Repeat.

Lesson Learned: *Mathematics, analyzing data, mean, median, mode, range*

Conducting An Experiment

LEGO Smart Creativity Contest Entry (MARCH WINNER!)

By Robert Cook, Georgia Southern University

Hypothesis: People find it harder to remember the color of objects as more are added.

Select all LEGO bricks of different colors. Place students in groups of four with one student selected to perform the experiments and record the results. Conduct two trials with each student for 4 randomly-selected bricks. Hide the bricks after 5 seconds. Ask the student to write down the colors. Record 1 if all correct and 0 if any colors were missed. Repeat the experiment with 6 colors. Ask each group to graph the result. The experiment can be repeated using shapes instead of colors.

Lesson Learned: *Experimental design, graphing, hypothesis*

Why Use Robotics In Nanotechnology?

LEGO Smart Creativity Contest Entry

By Jeanne Oiler, University High School

Explain size as it relates to nano's. Give examples of real things students may have contact with

Explain size as it relates to nano. Give examples of real things students may have contact with that are considered Nanotechnology.

Activity: Put students in teams of four. Each group member puts on a pair of oven Mitts, and gets a set of three LEGO bricks. Students are shown a specific arrangement of LEGO bricks that they will reproduce by having team member 1 pick one brick, hand it to team member 2 who adds one brick and passes it on to team member 3 who adds a brick and passes it to member 4 who places both his/her bricks and passes it back to member three. The motion is continued until the completed component matches the one shown by the teacher and all members are out of bricks. If the finished design does not match that of the teacher the team must take it apart and start over from scratch.

The catch: Only one team may speak freely, one can not communicate at all, and one can only use the words (right/wrong). I time the event to see what teams finish first. This is a great opener for a unit in Nanotechnology!

Lesson Learned: *Students develop a better understanding of why we use computers and robotics in the field of Nanotechnology. The activity also promotes team building and communication.*

Crossing The River Word Puzzle

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Choose suitable LEGO bricks for the boat, farmer, wolf, goat, and cabbage. A farmer is standing on one side of the river and with him are a wolf, a goat and a box with cabbages. In the river there is a small boat. The farmer wants to cross the river with all three items with him. There are no bridges and in the boat there is only room for the farmer and one item. But if he leaves the goat alone with the cabbages, the goat will eat the cabbages. If he leaves the wolf alone with the goat, the wolf will eat the goat. Only the farmer can separate the wolf from the goat and the goat from the cabbages. How can the farmer get the wolf, goat and cabbages across uneaten? Often problems can be solved by creating a simpler problem. Have the students make a list of possible first trips and then examine each one for a solution. Hint: one of the items has to make a return trip.

Lesson Learned: *Solving puzzles, logic*

Ice Cream Sundae

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Choose a coin value for the flat LEGO bricks (there are 5) and non-flat bricks that is grade appropriate. For example, 5 cents and 10 cents. Have the students draw pictures of different flavors of ice cream, fruit, and toppings; such as whip cream and M&Ms. Assign a cost to each item. Explain that each student has a budget with which to make the best ice cream sundae in the world. Have the students make a list of their expenses. Ask students to describe their creations and why they chose their ingredients.

Lesson Learned: *Money, budget, subtraction*

Money, Coin Counting

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Assign a coin value to flats (there are 5) and non-flats that is grade appropriate, such as 5 cents and 10 cents. Have the students draw pictures of items that they would like to sell on Ebay. As soon as a student finishes a drawing, they can post the picture with an expiration time for their auction. Students can bid by writing their name and amount on a piece of paper and then taping it to the item. To prevent chaos, the teacher may want to have students raise their hands before dashing to the bidding area. One or more students should be selected as time keepers to remove items when their deadline is reached. Students can keep a list of the starting amount \$0.57 and then subtract properly as items are purchased.

Lesson Learned: *money, coin counting*

Inventory

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Explain the concept of an "inventory" and why it is important. Explain that each item has a dimension measurement based on the number of knobs (e.g. 2x4). Note that 4x2 is the same as 2x4. Why? Usually, the smallest number goes first. Why is such a rule important? The items have different heights (brick or plate/flat or sloped) and a color. Have the students make an Inventory of their Smart kit. 1x1 pink brick 2x3 red plate 1x4 black sloped 2x2 yellow brick with eyes Save an inventory in each kit.

Lesson Learned: *Simple counting, two dimensions, organization*

Area Of A Triangle

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Have the students take the 4x4 green brick. Count the knobs (16). What is the area of the square? Count the knobs for half the area (8). Now have the students count the knobs in a right triangle formed by a diagonal. Note that counting whole knobs on the diagonal does not halve the square. Note that any division of a rectangle into halves equals half the area ($\frac{1}{2} \times b \times h$). Now take the red 2x4 brick. What's the area of its right triangle? ($3 + \frac{1}{2} \text{ knob} + \frac{1}{2} \text{ knob}$) Why is the area of a parallelogram $b \times h$? It is just a deformed rectangle. Thus the same formula applies to its triangles.

Lesson Learned: *Math concepts, area of a triangle*

Multiplication as Skip Counting

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Choose two bricks that match on 1 side such as a 1x6 and a 2x6. Explain that 1 times 6 is just the number of knobs, 6. Have the students count the knobs on the 2x6 by twos and that counting by the same number repeatedly is named "skip counting". Have the students count the knobs on the 2x6 by sixes. Why are the two sums the same? A six is the sum of 3 twos and the sum of two sixes is the same as the sum of 6 twos. Thus 2x6 and 6x2 are the same, defined as

commutative. Place the 1x6 and the 2x6 side by side. What is the product skip counting by threes, by sixes? Which is easier? Usually skip count by the smaller number. Repeat the exercise for other products. Have the students build a multiplication table by skip counting knobs for different brick combinations.

Lesson Learned: *Skip Counting*

Pythagorean Theorem

LEGO Smart Creativity Contest Entry

By Robert Cook, George Southern University

Materials: 4x4 green, 2x3 red, 1x1 pink, 1x2 green, paper, scissors Place 4x4 green brick on paper.

Place lower-left tip of red brick on upper-right tip of 4x4.

Place 1x1 and 1x2 on top of 2x3 to make a 3x3 square.

Use a pencil to draw the 7x7 square that encloses both.

What is the formula for the area of the outer square? $(a+b) \times (a+b)$

What is the formula for the two squares in the blank space? axb

If the blank squares are split by a diagonal, what is the area of each triangle? $1/2 \times a \times b$

How many such triangles are there? 4

Now cut out the 4 triangles and label the sides a and b and the diagonal c. Construct a 7x7 square with the 4 triangle's a and b sides as the circumference. Note that the c diagonals form an inner c by c square.

What is its area? $c \times c$

What is the outer area? $(a+b) \times (a+b)$

Subtract the area of the 4 triangles. $c \times c = (a+b) \times (a+b) - 4 \times 1/2 \times a \times b = a \times a + b \times b$

The Pythagorean theorem!

Lesson Learned: *Pythagorean theorem, proof by construction*

Set Theory

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Have the students choose two LEGO bricks, say the green brick and the orange brick. Have the students count the total number of knobs (union). Have the students snap one brick on the other then count the knobs in the overlapping area (intersection). Have the students cut out a small square of paper or choose a smaller brick. Place over one of the sets then count the knobs affected (subset). Repeat several times with different bricks. Have the students express their discoveries in set notation. Give the students some problems in set notation and have them establish the correspondence with bricks.

Lesson Learned: *subsets, intersection, and union of sets*

AutoCad: 3D LEGO Models

LEGO Smart Creativity Contest Entry

By Charles Horn, HEB ISD Technical Education Center

I hand each student an individual LEGO brick and a 3D LEGO model that I have constructed.

Students use AutoCAD to create three orthographic views and a realistic three-dimensional view.

One optional activity is adding color to the drawing that matches the model's color scheme. Another optional activity is letting the student create their own model and challenging the student next to them to draw the new model.

Lesson Learned: *Students apply engineering graphics skills using AutoCad to create 3D LEGO models. Students collaborate with each other to produce orthographic views and a 3D model.*

Reducing Fractions

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Have the students choose two bricks such as dark gray and light gray. The fraction is 6/12. Explain that reducing fractions makes it easy to determine if two fractions are the same. How many times does the 2x3 brick "go into" or "cover" the 2x6 brick. The result is the reduced fraction 1/2. Choose other pairs of bricks for practice. Another variation is to choose a fraction, such as 1/2, and then construct equivalent fractions like 2/4, 4/8, 3/6 etc.

Lesson Learned: *math concepts, factors, fractions*

Make Your Name Out Of LEGO Bricks!

LEGO Smart Creativity Contest Entry

By Tami Taylor, North Ranch Elementary

Use as many of the LEGO bricks in the kit as needed to make your name. If you have a long name and not enough bricks then just make your initials.

Lesson Learned: *Smaller children learn to write their name and letter recognition can help improve their letter skills*

LEGO Tangrams

LEGO Smart Creativity Contest Entry

By Mei Lee

Divide the class into two groups. Using seven pre-determined LEGO bricks from the set, the first group comes up with a shape and traces their outlines onto index cards. The second group takes the cards and tries to recreate the shapes with the LEGO pieces.

Lesson Learned: *Pattern recognition, problem solving*

LEGO Attributes

LEGO Smart Creativity Contest Entry

By Kendra Sweet, Tanglewood Elementary School

Divide the students into teams of 2 or 3 students. Students will be given a large Venn Diagram. On this diagram, the teams will decide how to divide/sort their LEGO bricks from one LEGO Smart Kit into two groups. They may sort by size, color, thickness, shape, etc. Once they have completed the Venn Diagram, they will compare the different methods each group used to sort the bricks.

Secondly, the students will be given a sheet of paper with a series of about 5 circles with two

arrows between each set of circles. The students choose which brick to put in the first circle. Then, they choose the second brick for the next circle, but it must have 2 and only 2 different attributes than the first brick. For example, if the first LEGO element is a square, thick, yellow brick, the second one could be a thick, green, rectangle brick. The two differences are the color and shape. They continue this through the set of circles.

The last thing for the students to do is to create a sculpture with their bricks using only bricks with shared attributes. For example, they may make a figure with all the thick bricks or all the rectangle shaped bricks.

Lesson Learned: *Students will learn to cooperatively work in small groups, using team building and communication skills. They will also learn to sort by varying attributes.*

Are You Body Smart?

LEGO Smart Creativity Contest Entry

By Evelyn Steege, Guy K. Stump Elementary

Divide the class into small groups. Every group gets a box of LEGO bricks to use to create. Assign a topic (can range from Autumn to Ancient Greece) and give students a 20-25 minute time deadline to finish. Before beginning the activity, we review cooperation rules such as respect for every group member's ideas and good leaders are not bossy. At the end of time every group shares their LEGO creation with the class.

Lesson Learned: *Students get to use their imagination and their hands and create something concrete for an abstract or any school topic. I have used topics such as fall, red ribbon(anti-drugs),friendship etc....The students' LEGO creations always amaze me with what they come up with. They also practice cooperation and teamwork as they build in small groups. After a set time period every group shares what they built with the class. This is a way to learn using body kinesthetics.*

Oral and Written Descriptions

LEGO Smart Creativity Contest Entry

By Teresa Hough, West Ward Elementary

Day 1: Explore materials.

Day 2: Create an object. Switch objects with a friend and copy their object.

Day 3: Create an object behind a privacy folder. Describe the object to a buddy and they make the object.

Day 4: Create another object. Write a description of the object. Share the description with another class. The other class makes the object described.

Day 5: The student can check their description against the object built. Revise and edit their work.

Lesson Learned: *Students will develop fluency in creating a variety of objects, learn communication skills through developing knowledge of adjectives and prepositional phrases.*

Simon Says

LEGO Smart Creativity Contest Entry

By Juanita Facticeau, Homeschool

With my 5 year old student, we decided to build a small, simple object with LEGO

with only 5 minutes, student was asked to build a easily recognizable vehicle from the LEGO bricks in the kit, leaving none left over. This activity could end up with variable results. First one I received was a space ship: Orange block on the bottom like a hover platform; light green brick above that; light gray, dark green and dark gray above that. On top of these there is a row of yellow bricks, slender green bricks, and blue bricks. Above that the black and small green and yellow on either ends like a hydrofoil. The yellow with the eye is the motor(with porthole) and is placed on top of the edge of the dark gray brick projected forward with another red below it, and above that is the flat white and red bricks. The black slanted is the front of the vehicle. Up underneath is the small pink brick for an exhaust. The results could be endless.

Lesson Learned: *Creating a specified project in a limited amount of time.*

What's On Your Plate?

LEGO Smart Creativity Contest Entry

By Heather Goodyear

1. Use LEGO bricks to create an arrangement on a paper plate.
2. Place plate in front of group of students and give them 2 to 3 minutes (or longer depending on age) to study the arrangement.
3. Remove plate with arrangement to spot out of sight.
4. Give each student a paper plate and markers, crayons, or colored pencils.
5. The students' task is to recreate on their paper plate the arrangement that they studied.
6. When teacher decides students have been given enough time to draw what they remember of the arrangement, bring out the original paper plate and have students compare their drawings on the paper plates with the original arrangement.
7. This activity can be done with the whole class, or in groups or pairs with students creating the arrangements for others to draw.

Lesson Learned: *Concentration, recall, memory skills, spatial placement*

Alligator Chomp

LEGO Smart Creativity Contest Entry (FEBRUARY WINNER!)

By Judy Leddy, Durham Elementary School

Young students will construct a LEGO alligator to teach the concept of greater than or less than when comparing numbers. Draw your greater than/less than sign. Now, add teeth to the "mouth" part. Use the LEGO alligator with his mouth open to eat the greatest number. Students will practice drawing the greater than sign $>$ with number examples such as $10 > 6$. Since we must always read left to right, sometimes the less than symbol is used. We can turn the $>$ symbol around to point out that one number is smaller than another. We call this the less than symbol, $<$. An example is $5 < 7$. Remember, the alligator's mouth will always want to gobble the larger number. When the numbers are equal, the mouth doesn't know which way to go so it is an $=$ sign. Students will have fun using their LEGO alligators to learn comparing numbers!

Lesson Learned: *Young students will work in teams and use their creative thinking and team building skills to design an alligator with all the LEGO bricks. The alligator will be used as an aid to teach the concept of greater than or less than when comparing numbers.*

Rectangles, Prime Numbers, and Squares! Oh My!

LEGO Smart Creativity Contest Entry

By Phil Malone, Carroll Engineering And Robotics Society

This activity is performed ONLY with the full-height blocks (no plates or ramps). Students are challenged to make the biggest rectangle possible with the available LEGO bricks. The bricks are not interconnected, simply laid side-by-side. Students must organize 1x and 2x bricks to form a complete rectangle with no holes or openings. After making a rectangle, the student should calculate the area of the rectangle (in LEGO studs). The concept of $\text{area} = \text{length} \times \text{width}$ is explained. Can they go bigger? What is the largest possible area? 88 studs. There are several different length x width combinations. eg: 44x2, 22x4 and 11x8 Why can't you use ALL the bricks? There are 89 total studs, but 89 is a prime number, therefore no two numbers can be multiplied together to get an area of 89. There will always be AT LEAST one stud left off. Now the students can be challenged to make the biggest Square possible. Same rules apply.

Lesson Learned: Rectangular geometry, Area calculation, Trial and error, odds & evens, Prime numbers.

Build The Largest And Most Effective Turbine

LEGO Smart Creativity Contest Entry

By Peter Funk, Maumee Valley Country Day School

Using all the the pieces in the LEGO Smart Kit, create the tallest and most effective wind-turbine.

Lesson Learned: Team building skills and how to be resourceful with the small amount of LEGO bricks available

Podcasting About Robotics

In the most recent episode of *Robots - The podcast for News and Views on Robotics*, engineering education at the elementary level is discussed.

First up is **Chris Rogers**, a Tufts University professor who is an avid supporter of engineering and youth. He has a long history with LEGO Education and speaks about his work and the impact robotics and engineering can have in the classroom.

Following Chris is **Liz Herron**, director of the LEGO Education Center in Southlake, Texas. Liz talks about her experience with children and robotics at the Center and the excitement it has created for the program.

Check it all out now by visiting <http://www.robotspodcast.com/>

LEGO Bridge To Nowhere

LEGO Smart Creativity Contest Entry

By Nate Underwood, Valley Country Day School

Take the LEGO bricks out of the bag and set them on a table. Take two rather large books and set them side by side. Try to create the longest bridge possible that will stay together and not fall. *NOTE: The bridge does not have to support any weight only span the longest length possible. If more of a challenge is needed ask students to balance 5 paper clips on it also.

Lesson Learned: Students will learn team building skills and how to establish a sense of

thinking outside the box. They will also enhance hand and eye coordination.

Build A Turtle

LEGO Smart Creativity Contest Entry

By Sam Fixler, Maumee Valley Country Day School

Build the most realistic turtle using only the green LEGO bricks, yellow LEGO bricks, black LEGO bricks, and dark grey LEGO brick.

Lesson Learned: Team building and working together to create the best design.

Stack and Group for Math Fun

LEGO Smart Creativity Contest Entry

By: Yolanda Hairston, The Hairston Academy

Give students the same number of LEGO bricks. For example 7. They should have a piece of paper and a pencil. Tell the students they will have 10 minutes to put the LEGO bricks in groups by stacking them to make number sentences. They should write down each number sentence as they group the LEGO bricks. For the example $1 + 6 = 7$ can be one answer. Set a timer and have the students go to work. See how many they can come up with in the time given based on the number of LEGO bricks they have.

Lesson Learned: Students learn to use critical thinking while increasing adding and counting skills.

Can You Copy?

LEGO Smart Creativity Contest Entry

By Jen Tilley, Woodland Elementary

1. Each student builds a creation with their set of LEGO bricks.
2. Each student writes step by step directions for building their object.
3. Students trade directions, and try to re-create the object being described.
4. Did they turn out the same? Were your directions detailed enough?

Lesson Learned: description and details, following written directions

Graph and Build

LEGO Smart Creativity Contest Entry

By Jen Tilley, Woodland Elementary

1. Each student pulls out a handful of bricks.
2. Students tally the colors, then fill out a bar graph for their tally marks.
3. Finally, students must make a creation using all the bricks they pulled.
4. Display the creations with their graphs.

Lesson Learned: graphing, counting, tally marks

Add and Build

LEGO Smart Creativity Contest Entry

By Jen Tilley, Woodland Elementary

1. Assign a point or money amount to each color of LEGO brick.
2. Provide students with a point or money value to reach (whole group) or cards with various point or money amounts (small group/individual).
3. Students must build an object that is worth the set number of points or money amount.
4. Students can then make a list of LEGO bricks used and show their addition.

Lesson Learned: *addition and subtraction skills, estimating, money addition*

Balancing Tower

LEGO Smart Creativity Contest Entry

By Kristi Rawlins, Butte MT Homeschool

Starting with the pink brick as a base, assemble all bricks into a balanced tower. Bricks must ascend from smallest to largest, as tall as possible and must stand on its own.

Lesson Learned: *Mechanics of Mass Distribution*

No Words

LEGO Smart Creativity Contest Entry

By Kristi Rawlins, Butte FLL Robotics Homeschool Club

A design object is chosen by the leader (specific animal, building, person, etc.). Two team members use one kit to design the object, each taking turns applying one brick at a time. No words are allowed and not all bricks need to be used.

Lesson Learned: *Team Design, Cooperation, Design Flexibility and Creativity*

Stairstep Pyramid

LEGO Smart Creativity Contest Entry

By Sean Anderson, USAF Academy

Tell the students they can use all bricks with the exception of the slanted black brick. The goal is to achieve the tallest tower possible while being able to climb the tower in thin plate increments. In order to explain this to younger students, suggest that a small ant can only climb one plate level at a time and must be able to climb to the top of the tower from the ground. To encourage greater creativity, tell the students that the path may travel under bricks but they must leave at least one brick of height in order for the 'ant' to fit. I was only able to make my staircase 13 thin levels tall. See if your students can achieve more!

Lesson Learned: *This exercise is designed to push students ability to think outside the norm in order to excel. Another emphasis item is for students to plan how their product will take shape before they start putting it together in order to maximize results.*

Volume

LEGO Smart Creativity Contest Entry

By Beth Smith, Homeschool

Divide the students into pairs and give each pair a set of LEGO bricks. Ask the students to look

at the small pink brick. For this activity tell them that the pink brick represents one (1) LEGO unit of volume. In other words, the pink brick is one (1) LEGO unit high, one (1) LEGO unit long and one (1) LEGO unit wide. Have the students locate the orange bricks and ask the following questions: How many LEGO units of volume is the small orange brick? (Answer: 4) How many LEGO units of volume is the large orange brick? (Answer: 8) Have the students stack the thin lime green brick, one of the thin red bricks, and the thin white brick on top of each other. Compare the height of the pink brick to the stack of three (3) thin bricks. Ask the students to determine the height of one of the thin bricks. (Answer: $\frac{1}{3}$) Have the students locate the black bricks and ask the following questions: How many LEGO units of volume is the thin black brick? (Answer: 4) How many LEGO units of volume is the slanted black brick? (Answer: Approx. 6) Next tell the pairs of students to build a solid LEGO structure that is exactly two and one third ($2\frac{1}{3}$) LEGO units high, six (6) LEGO units long, and six (6) LEGO units wide. The structure must be solid with no voids or gaps. Ask the students to compare their structure to others in the class. How many different ways did the class come up with to solve the problem? Were they all correct? What bricks were left over and why? Final question: What is the volume in LEGO units of each structure built by the students? (Answer: 84)

Lesson Learned: *Students learn about volume by using an arbitrary unit of measurement. They also learn to problem solve together as a team.*

Looking For LEGO Maps & More

LEGO Smart Creativity Contest Entry

By Pam Ward, Sussex School

This activity was played with a combined 2nd/3rd grade class of 18 students. They were randomly divided into 2 groups, and separated into 2 areas of our classroom. Each student chose a LEGO brick, drew a map of our classroom (including a compass rose) and then drew their LEGO brick on their map. Students in both groups 'hid' their LEGO bricks (in 2 different areas of the classroom) and then exchanged maps with a student from the other group. Students from Group 1, having received the maps created by Group 2, went off to find the bricks hidden by Group 2 using the map as a guide to find the LEGO bricks (and vice-versa). Then, as a group, they combined their 9 LEGO bricks, created a LEGO sculpture and a title for the sculpture, with each student contributing at least one word for the title, and one idea as to where their piece might be built into the sculpture. The team that accomplished all the tasks (including drawing an accurate map for a student in the other group) shared their sculpture and title first. The students had fun drawing maps, and said that it was like a 'treasure hunt' finding LEGO bricks. Group 1 sculpture title: A quacking duck standing in grass looking for lots of fish Group 2 sculpture title: A blue-footed booby bird flying on water and doing the backstroke!

Lesson Learned: *Mapping Skills: identifying directions on a map & using directions to locate LEGO bricks, recognizing symbols on a map that represent actual objects, drawing a map of the classroom. Team Building Skills: communicating with others to create a LEGO sculpture and title, including ideas from every person in the group. CREATIVITY!*

Fractions, Volume, & Surface Area with LEGO

LEGO Smart Creativity Contest Entry

By Thomas Brooks, Henry County Middle School

The initial activity would involve a simple study of the fractional relationship of each brick in relation to the 1x1 base unit brick. This activity would primarily use the standard height bricks.

Thin bricks could involve a discussion of fractional portions. Area can be examined by considering the area of a particular side of a brick, using the single stud as the standard unit of measure for bricks. Volume can also be explored by measuring the height, width and length of various bricks. Surface area can be explored when students consider each face of specific bricks. An extension of this can include adding bricks together and determining the combined volume or surface area. Students would have to consider the connection points of the bricks as a factor of determining accurate surface area. Special bricks, such as angled roof tiles or curved bricks, can be used for further exploration to work on understanding variables affecting surface area and volume that would reflect real world situations.

Lesson Learned: *Using the 1x1 standard height brick as the base unit, students will manipulate other bricks and determine their fractional relationship. An example could be that the 1x1 block is 1/4th of a 1x4 brick and 1/16th of a 2x8 brick. Students can also use the bricks to further explore the volume of a brick and the surface area of a brick or a combination of bricks. These activities would increase student spatial awareness and promote higher level thought.*

3D CAD Pirate Ship Version 2

LEGO Smart Creativity Contest Entry

By Fatima Shakra, Putnam City High School

LEGO Project Instructions Start with the 2x8 brick on the bottom. The 2x4 brick needs to go on the right on top of the 2x8 brick. The 2x2 brick needs to go on the left of the 2x4 brick and on top of the 2x8 brick. The 2x6 brick needs to go on the left of the 2x2 brick and on top of the 2x8 brick. The 2x6 flat brick needs to go on top of the 2x6 brick. The 2x2 brick needs to go on the very left side of the 2x6 flat brick. The 2x3 brick needs to go on the very right of the 2x6 flat brick. Both of the 1x2 bricks need to go on the very right side 2x3 brick. The 1x4 brick needs to go on top of the 2x2 brick that is on top of the 2x6 flat brick. The 1x6 brick needs to go on top of the 1x4 brick. On the top of the 1x6 brick needs to be the 1x1 brick. The other 2x4 brick needs to go on top of the first 2x4 brick. The 2x4 flat brick needs to go on top of the 2x4 brick. The 2x3 flat brick needs to go on top of the 2x4 flat brick. Then the 2x2 brick needs to go on top of the 2x3 flat brick. The 2x2 flat brick needs to go on top of the 2x2 brick. The 4x4 flat brick needs to go on top of the 2x2 flat brick. Last, the 4x3 slant brick needs to go on top of the 4x4 flat brick.

Lesson Learned: *How to construct LEGO bricks in 3D cad.*

Spaceship

LEGO Smart Creativity Contest Entry

By Gregory Jenkins, Putnam City High School

- 1: Go to assembly, add component and get the 1x6 LEGO brick
- 2: Go to assembly, add component and get the 2x6 flat brick
- 3: Put the 2 pieces together
- 4: Go to assembly, add component and get 2 2x bricks
- 5: Put the 2x2 bricks on the opposite sides of the 2x6 brick
- 6: Go to assembly, add component and get the 2x3 flat brick
- 7: Put the 2x3 flat brick in the middle, between the 2x2 bricks
- 8: Go to assembly, add component and get 2 1x2 bricks
- 9: Place them right on top of each in between the 2x2 bricks
- 10: Go to assembly, add component and get 2x4 flat brick

- 11: Put it under the 2x3 flat brick
- 12: Go to assembly, add component and get the 2x4 brick
- 13: Place it on top of the 2x3 brick
- 14: Go to assembly, add component and get the 1x1 brick
- 15: Place the 1x1 brick underneath the 2x4 flat brick
- 16: Go to assembly, add component and get the 1x4 brick
- 17: Place it on top of the 1x2 brick

That's your spaceship

Lesson Learned: *Just because you are not creative doesn't mean you cant come up with something creative*

3D CAD Pirate Ship

LEGO Smart Creativity Contest Entry

By Will Isbill, Putnam City High School

Start with the 2x8 Lego brick then mate in this order... (fix the 2x8 brick) 2x6 brick on top of the 2x8 brick. 2x2 brick on top of the 2x8 brick. 2x6 brick on top of the 2x8 brick. 2x6 flat brick on top of the 2x4 brick. 2x4 brick on of the 2x6 brick. 2x4 flat brick on top of the 2x4 brick. 2x3 flat brick on top of the 2x4 flat brick. 4x4 flat brick on top of the 2x3 flat brick. 2x3 slant brick on top of the 4x4 flat brick. 2x2 brick on of the 4x4 flat brick. 2x3 brick on top of the 2x6 flat brick. 2x1 brick on top of the 2x3 brick. 2x1 brick on top of the 2x3 brick. 1x1 brick on top of the 2x1 brick. 2x2 brick on top of the 2x6 flat brick. 2x2 flat brick on top of the 2x2 brick. 1x4 brick on top of the 2x2 flat brick. 1x6 brick on top of the 1x4 brick.

Lesson Learned: *Align Assembly Mate all those things go look it up*

3C CAD Program Spaceship

LEGO Smart Creativity Contest Entry

By Shannon Kelley, Putnam City High School

You are going to make a spaceship. Here are the steps. Take the 4x4 flat LEGO brick and attach the 2x4 LEGO brick to the top. Then add the 2x3 LEGO brick to it so it overlaps the 4x4 flat by 1x1. Add another 2x4 LEGO brick next to the 2x3 LEGO brick. This should over lap 2x2. Now, underneath the last two LEGO bricks you added, you need to connect the 2x4 flat LEGO brick to them. Now it looks like a rectangle but we've got an open spot because of the 2x3 LEGO brick. Add a 1x2 to the end to make the whole thing a rectangular prism. Now you want to add the 4x3 slant LEGO brick to the top so it does not overlap, but fits on top. Now add the 2x8 LEGO brick behind the slant brick so that it's even. Right behind that, add a 2x6 LEGO brick that is also even on the rectangular prism. Now there will be some hang over from the last brick we added so add another 2x6 underneath it. From the last brick we added, there is a 1x6 space on top, so add the 1x4 brick there, in the middle. We have 3 2x2 LEGO bricks to use and you'll connect them to the top of the 2x8 brick. One on either side and then one in the middle of those. Behind the one in the middle you'll put another 1x2 LEGO brick. For extra base, turn the spaceship over and add the 2x6 flat brick to where it's even, then the 2x3 and 2x2 flat bricks next to it. (There is a 1x1 space left, but it's ok.) You can add the 1x1 block anywhere you like, and you're done!

Lesson Learned: *Hand eye coordination and How to follow instructions to make a product.*

Mobile Bricks

LEGO Smart Creativity Contest Entry

By Brian Leger, Seton Homeschool

Working in pairs, instruct students to build a vehicle of their choice out of their set of LEGO bricks. Give the children approximately 5 minutes to complete their vehicles. Have the children compare their creations at the end. Were there some similar ideas? Were there some that were out of the ordinary? Also, have them answer the following questions: Which vehicle would carry more people? Which would move the fastest? Which would carry more cargo? Then have them tell which they would most like to ride in and why. To modify for older children, have them provide estimates of how many people could be carried, how fast they would go, etc.

Lesson Learned: *Team Building, Transportation, Basic Engineering, Estimating*

Teeter Totter

LEGO Smart Creativity Contest Entry

By Patricia Tsoiasue, Shared Science

Work in groups of 2 or 4, with each person taking a turn. With a single brick (any of the set) as the base, build on either end of that brick so that the entire structure is as long as possible, without it tipping over or any of the bricks falling off. If this occurs, remove the last brick and stop. Measure the resulting structure.

Lesson Learned: *Hand-eye coordination, greater sensitivity to structures.*

Bridge Over LEGO Waters

LEGO Smart Creativity Contest Entry

By Nancy Meyer, William Byrne Elementary

Put students into pairs or groups of three. Give each group a LEGO Smart Kit. Using the large blue brick as water, the students must use the remaining bricks to build a bridge over the water brick placed the long way. The bridge will need to cross the "water" and also be strong enough to hold either a coffee mug or a stapler. (Your choice) Give them a specific time allotment to finish their bridge. (5 min) After the time is up, test the bridges for strength. Students can compare the various bridges and you can even test to see which one is the strongest. Discuss the problem solving and communication skills they used when building the bridge.

Lesson Learned: *Problem Solving Skills, Comparison, Team Building*

Walk The Plank

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Everyone knows that pirates make their captives walk the plank! But how hard is it for a pirate to get the plank to work right? Using only the LEGO Smart Kit, have the students build the longest plank possible so that no part of the plank, except a single base block touches the ship. Pick one of the blocks as a captive. Can you prevent your plank from tipping over when the captive is placed on the end of the plank?

Lesson Learned: *Physics - weights and balances*

Fallen Arches

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Have the students build a bridge to span the space between two books using a single span design. Use a coat hanger or hook to place a weight on the center of the bridge. What happens? Why? Now build an arch bridge and repeat the experiment. What is the difference in weight supported?

Lesson Learned: *Physics - Arches versus Spans*

Are You Smarter Than A Tree

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Trees "know" how to grow tall without falling over! Pretty smart. Have the students (singly or in groups) stand the 2x8 brick on end as the tree trunk. No other brick can touch the ground. Have each group add branches to their tree. Try for the widest? bushiest? tallest?

Lesson Learned: *Botany -- plant growth*

Crazy Squares

LEGO Smart Creativity Contest Entry

By Robert Cook, Georgia Southern University

Why is squaring a number called "squaring"? Because that mathematical operation computes the area of a square figure, such as the foundation of a building. A builder then knows how much concrete to pour for a foundation. Challenge students to construct all squares from 1x1 to 10x10 using the LEGO Smart Kit. There can be no spaces showing within the square! Have them count

the number of studs to construct their own table of squares. Yes, it is possible, but students might need some help with 9x9.

Lesson Learned: *Table of Squares from 1 to 10 multiplication, area of a square*

Estimago!

LEGO Smart Creativity Contest Entry

By L. Scott, Sheridan Park Elementary

Teacher will call out a measurement (23 cm or 10 inches etc.) Then the students (in teams or not) will have to use all their LEGO bricks to make that length (without using a ruler). Then after the allotted time...the students will use a ruler to see which students or team got closest to the measurement.

Lesson Learned: *To estimate length*

Mythical Creature

LEGO Smart Creativity Contest Entry

By Melissa Gregory, Shawnee

Divide kids into groups. Have them make a mythical creature in five minutes. They can use all or a few of the bricks. Then have them discuss what happened and what they learned. Have them give reasons why they used the bricks and encourage them to use describing words. Students offer compliments as they are talking about each creature.

Lesson Learned: *They learn that every one has different ideas and that they should listen to each others ideas and that what they do and make expresses themselves. It helps several with ADHD and does help with hand-eye- coordination. This activity encouraged all students to communicate in a way that was fun for them. They really learned more than I expected.*

Build Your Best Bridge with Ten LEGO Bricks

LEGO Smart Creativity Contest Entry

By Molly Hackett, Soos Creek Elementary

The purpose of this project is for students to design the "Best Bridge Possible with Ten LEGO Bricks". I intentionally do not specify what I mean by "best". I may follow-up with, "A bridge you would want to use." Sort students into groups of 4-5 and give each group a LEGO Smart Kit. Students are then given 15-20 minutes to design and build their best bridges using any ten pieces from the kit. During this time, students also record metrics: 1) Measure the height of the bridge at the tallest point 2) Measure the length of the bridge from end to end. One student records which LEGO bricks were used and another student draws the final design. At the end of the time each group shows and tells about their bridge to the class (presenter). From the information presented, determine which group built the tallest bridge and which group built the longest bridge. Take a class vote to decide the "coolest" bridge (this is subjective). From the above analysis, the class will do a final vote to decide which group built the best bridge - the bridge they would want to use if they lived in LEGOLand. Close the session with a discussion of what makes a good bridge. Also discuss how purpose and resources are integral to any design process.

Lesson Learned: *I designed this task to cover both soft and hard skills: team work & engineering, communication and metrics.*

Stair Steps

LEGO Smart Creativity Contest Entry

By Erica Alberty, Alberty Academy

Give each student a LEGO Smart Kit. Instruct students to build stair steps from the bricks in the set. Example: Start with a single stud brick and increase each step by one stud. The steps can be 2-D or 3-D. It's interesting to see the variations the students come up with.

Lesson Learned: *Students learn logical thinking. Being LEGO smart means you like a challenge and enjoy thinking outside of the box.*

Similar But Different

LEGO Smart Creativity Contest

By Jeff Rosen, CEISMC

Divide the students into groups of two. Provide each group with a set of LEGO bricks of varying sizes. Ask the students to group the bricks to create at least three shapes with the same size.

Once they have completed that task and the teacher has verified their understanding and design, have them clear their workspace for the next challenge. Once everyone is ready ask all groups to produce the same shape (dimension i.e a 6 x 5 shape). Once all groups have constructed their designs have them draw their design on a sheet of paper. Then have the students rotate to the other groups designs and draw a picture of the other designs. Once they have seen and drawn all constructions, have them write a sentence that explains how their design compares and/or contrasts to the other groups designs. This could be used as an activity to introduce the concept of similarity.

Lesson Learned: *Students will learn the basic concept of similarity in shapes, teamwork, and graphic representations of designs.*

Symmetry

LEGO Smart Creativity Contest Entry

By Carrie Britt, Britt Farm Homeschool

Create an object with one line of symmetry using all of the LEGO bricks (disregarding color). Be ready to explain where the line of symmetry is located and what makes it a line of symmetry. Now, build an object with multiple lines of symmetry. Be prepared to explain where they are.

Lesson Learned: *Students find the line or lines of symmetry in a 3-D object.*

Upside Down LEGO Math

LEGO Smart Creativity Contest Entry (JANUARY WINNER!)

By David Ashdown, WSWHE BOCES

Instruct students to place all of the LEGO Smart Kit bricks upside down on the table. They should put aside the 5 bricks that do not have at least one complete "circle" on the back (i.e. any of the 1x LEGO bricks). This should leave them with exactly 51 "circles" to use for this activity. Have a student connect any two bricks of different size together and count the number of "circles." They will soon realize that connecting any two LEGO bricks creates a mixed number or decimal (i.e. 3 and $\frac{1}{2}$ or 3.5 circles). Next have the students split up into pairs. Connecting only the light and dark grey bricks, have the students show 5 and $\frac{1}{2}$ (5.5) circles. Next, have the students connect only the two red bricks to show 4 and $\frac{3}{4}$ (4.75) circles. For a real challenge, have students show 5 and $\frac{1}{4}$ (5.25) circles connecting only the two orange bricks and the dark grey brick. HINT: The smaller orange brick will be "under" the other two bricks with only a quarter of the circle visible. Once you are sure they understand the concept, have each student create a problem for their partner to solve. You could also place a larger mixed number and/or decimal on the board (e.g. 23 and $\frac{1}{2}$ or 23.50) and let the teams work together to find different solutions. HINT: Count the whole circles first when adding up the total number of circles.

Lesson Learned: *This activity is designed for grades 4-6 mathematics (specifically, using mixed numbers and/or decimals). In addition, students will learn to work cooperatively to solve problems and discover there is often more than one correct solution to a problem.*

Making a Scale Model of Earth

LEGO Smart Creativity Contest Entry

By B. Brad D. Booker, Pleasant Hill Academy

Divide the students into groups of four. Assign the students roles at each table. Allow the

students to gain an understanding of their role by placing their duties on the back of each card. Provide instructions to the students and allow them to develop a drawing of the scale model of Earth on their own. Give the students 15 minutes to brainstorm by visualizing how the earth should be structured. Once the timer has gone off, the teacher will go around and view the drawings, ask questions and grant permission for the students to begin the next step of the process. The next process will be for each table to take LEGO bricks and create a model of the earth. The teacher will reset the timer and grant the students 20 minutes to develop their model of the earth. Once the model has been assembled, teacher will provide time for students' to engage in a dialogue regarding the different models. Each group would have to share their experience of assembling the pieces to formulate the earth. Students would have to do some reflections and possibly answer a series of questions regarding their display.

Lesson Learned: *During this process students will develop team building skills. Through this process the students will be able to incorporate the multiple intelligence strategy developed by Dr. Howard Gardner and cooperative learning activities developed by Dr. Spencer Kagan; by incorporating these strategies into my lesson will enhance the student's level of achievement by cross examining and comparing materials among their peers and making precise decision that will elevate their level of thinking. By using the Multiple Intelligence strategy will provide the students an opportunity to infuse the love of art, drama, their hobbies and imagination into building the method of brainstorming to develop higher understanding of discovery. The method of cooperative learning can be incorporated into this activity as well. By using this method will enrich the students' level of learning and academic achievement. This strategy will allow the students' to gain an understanding from their peers and promote effortless answers for all to celebrate on their accomplishments of working together. Hand coordination, Read, Share, Pair and Think, Guide Practice, Modeling, accepting constructive criticism, team building working developing Interpersonal and Intrapersonal skills are a few activities that will allow the students' to gain a better understanding of the subject matter.*

Perimeter and Area

LEGO Smart Creativity Contest Entry

By Jessica Novotny, West Chatham Elementary School

Concepts of area and perimeter need to be covered prior to activity. Teacher will split students into teams. Teacher will have a LEGO mini-figure such as a construction worker or pirate. Teacher will explain that the LEGO mini-figure is looking to hire someone to build a house for him. A pirate to hide his gold, a construction worker for his family, etc. The LEGO mini-figure however has a special house in mind. He wants a two story house with a (you decide) perimeter and/or area. He also needs a garage that is (define your perimeter and/or area). The LEGO mini-figure will then choose the best home for himself that best meets what he asked for. Give students a list of area or perimeter requested. Students must work together to build a house with the following specifications that the LEGO Mini-figure wants. Students will construct the home. Students will fill out a completed form on the house. How many bricks did they use to build the house? What is the area? Etc. The teacher can then select the home for the LEGO mini-figure that was most creative and fit the requests made.

Lesson Learned: *Team building skills, communication, terms perimeter and area*

Letter Recognition

LEGO Smart Creativity Contest Entry

By Jessica Novotny, West Chatham Elementary School

This activity will be best taught in small groups or centers for Kindergarten and Pre-K students. This activity focuses on letter recognition and promotes hands-on experience. Using a small group of students introduce a letter or letters of the alphabet. Show the letter in traditional writing and again in block lettering (build the letter out of straight segments on paper). After letter is introduced, students can independently construct out of LEGO bricks the letter that was introduced. Once completed students can talk about how they made the letters(s) and will actually be able to hold and feel the letter for tactile purposes. Students can talk about how many sides or lines there are in the letter. This activity would be exceptionally helpful for more hands-on students and students who have extreme difficulty with letter recognition. They can then trace or transfer their letter to paper for concrete assessment purposes and accountability.

Lesson Learned: *Students will learn letter formation and letter recognition through play. This will also promote creative thinking as well as fine motor skills.*

There's Something Wrong With My Pattern

LEGO Smart Creativity Contest Entry

By Diane Berkley, Ernest R Graham Elementary

Using different colors, place a pattern containing at least nine (9) LEGO bricks down but place an incorrect color in the pattern. The student must identify the error and correct it using the other LEGO bricks. The activity can be modified to include size and shape.

Lesson Learned: *The student will learn will learn problem-solving skills by manipulating LEGO bricks to correct a pattern.*

Fraction Fun

LEGO Smart Creativity Contest Entry

By: Michele Perrin, Marian Middle School

Ask each student to model the fraction one-half by placing a small LEGO brick on top of a larger LEGO brick or plate. Is there more than one way to model this fraction? Next ask students to model the fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{1}{8}$. What fraction is represented by the uncovered portion of the base brick? Is there a relationship between the fraction formed by the covered portion and the fraction formed by the uncovered portion of the base brick?

Lesson Learned: *Students will gain a visual understanding of fractions and proportions, and will realize that the same fraction can be represented in multiple ways.*

An IT Director's Success Story...

My success story. I am 23 years old and currently the Director of IT for North Cross School in Roanoke, Virginia. I received your LEGO Club Jr. Magazine and corresponding Teacher's Guide in the mail today and it reminded me of how everything got started.

I was in 5th grade and my teacher had ordered a kit for the classroom. She deemed it a special product and only kids that could stay after school could work on it. Everyone that could stay would put their name into a hat and 3 people would be chosen. I was one of the lucky ones.

We got to build and program a LEGO elevator/crane. It was amazing. We got to see what happened when the programming was correct and when we messed up. It kept us occupied for weeks; finally we got to demo it to the class. Everyone was so impressed

weeks, finally we got to demo it to the class. Everyone was so impressed.

In high school I started taking programming and networking classes. Finally, I ended up at Old Dominion University in Norfolk, Virginia, and graduated in 2007 with a BS in Business Administration, with a concentration in IT.

Throughout my college years I had worked as an assistant systems administrator for NCS, after graduation I went to work full time as an IT Analyst for Roanoke City Schools and a year later I was looking at a Directors position at NCS.

I give that little LEGO set the credit for getting me interested in computers and programming and to this day have LEGO Education to thank for getting me started and achieving my goal of being the Director of IT for a company.

So to you, I tip my hat and with a warm heart say, "Thank You".

Zack DeMoss

LEGO Smart Creativity Contest

Now through August 2009, LEGO Education is hosting an activity challenge for educators of all grades and subject areas!

The LEGO Smart Creativity Contest begins with your imagination and ends with one Grand Prize and eight monthly winners, online recognition, and the chance to share your activity with thousands of students across the nation!

The task is simple. **Create an activity using only the bricks included in a LEGO Smart Kit.**

Anyone employed or working in the education field is eligible to participate. This includes teachers, home school educators, classroom aides, after-school facilitators, coaches, and administrators! One free kit is provided per request. The contest is limited to online participation only, no purchase necessary.

Come join the challenge! Visit www.LEGOeducation.us/CreativityContest or click the contest logo found on our homepage for details!

2009 Catalog Is Here

The 2009 LEGO Education Main Catalog is here and ready for distribution!

For the first time in LEGO Education history, a complete continuum of robotics hardware, software, and curriculum for students in elementary school through university level is available! Check out the catalog's robotics section to see what you can add to your tech-savvy classroom!

Updated programming software, a new *NXT* touch sensor, fresh activities from Carnegie Mellon University, and an updated *Simple and Motorized Mechanisms Set* round out the enhancements viewable in this year's main catalog.

With color-coded sections for each topic, the 2009 LEGO Education Main Catalog is organized in a way that makes it easy to find the right product for any lesson or activity.

[CLICK HERE](#) to order yours today!

Free ROBOTC Webinars!

Starting the first week of November, Carnegie Mellon Robotics Academy will begin offering their

second series of "Learning ROBOTC" Webinars!

The Academy will host 5 weekly webinar training sessions for ROBOTC enthusiasts of all levels and platforms. The ROBOTC webinars are designed for anyone interested in learning more about ROBOTC, from the absolute beginner to the advanced programmer.

All webinars are free of charge and include a forum where participants can get questions answered before, during and after the session. Webinars will be recorded for those who cannot attend and the forums will be monitored daily to answer questions.

Registration is required. To learn more about the available sessions or to register, [click here](#).

LEGO Smart News

For the latest LEGO Education news, product updates, and robotics builds, check out the most recent issue of [LEGO Smart News](#)!

Inside this online publication you will find features on the [LEGO Education Robotics Continuum](#), product launch information for [LEGO Education WeDo Robotics](#) and [TETRIX by Pitsco](#), as well as details on how your students can become [LEGO Smart](#)!

Interested in viewing the issue in printed form? [CLICK HERE](#) to download your copy!

Summer Camp Success Story

During the week of July 14-18, Lenoir County Public Schools hosted their first-ever Robotics

Summer Camp. Twenty-four rising fourth and fifth graders attended the week-long event that made headlines in both the local newspaper and online. Below is what one camp staffer had to say about the experience.

"On the first day students were divided into teams. They came up with team names, built their first robots, and experimented with basic programming. Each day after that we (camp staff) taught new programming and issued challenges for the students to solve using their robots. Points were awarded to teams for their efforts.

On Friday a final 'Robot Rumble' was held with trophies being awarded to the winners for the week. We even had the local newspaper come out and do a story on the camp and its success. You can read it at [Kinston.com](#).

I just wanted to share what an absolutely wonderful experience this was for both our students and the staff! The intensity of math and problem-solving was amazing! If you want to see our camp website, go to [gadgetcamp.wikispaces.com](#) and click on the links for Robotics Camp - Summer 08.

I can honestly say I am hooked! We will be submitting our proposal to teach a session on our camp experience and how to set-up your own camp at the North Carolina Education Technology Conference in December. I will let you know if we get accepted."

Charles White

Media Center and technology Coordinator for Lenoir County Schools

Something To Write Home About

Recently we received an email regarding a student who attended a robotics camp in Florida. The

recently we received an email regarding a student who attended a robotics camp in Florida. The camp featured LEGO MINDSTORMS products. The student was not very sociable or familiar with computers when he began the camp, but that was about to change. To learn how, read the following...

I teach Electrical Engineering at Florida State University in Panama City. With the help of some friends from Dahlgren I was able to get some LEGO MINDSTORMS sets for our camp. I wanted to share one of our camp stories with you that was pretty interesting.

One of the minority students that attended was listed by the school system as homeless. I believe he was the only attendee from his particular middle school. Needless to say he doesn't have computer or internet access in his home.

According to the teacher he kind of hung back when the camp started. That was until we got started with the LEGO kits!

It seems we discovered a natural programmer! He took charge of the programming for his group. The transformation was phenomenal. I wish you could have seen his eyes light-up when he described what he had accomplished during the camp - - pure joy!

At the end of camp I had him talk to our Congressman Boyd's area rep about his experience and he was part of the three students that were chosen to present the results of his team to the 150 students, teachers and S&Es at the final report out.

One of our leaders is a long time member of the Bay Education Foundation and is now working on finding him a mentor. First thing Monday I am contacting the local community college to see if they can line him up with a scholarship.

Just wanted to let you know LEGO's impact!

David Skinner

Florida State University, Panama City

Hands-On Learning

How many times have you heard a child say they didn't want to do something because it wasn't any fun?

If you are an educator, especially of preschool or early elementary students, there is a good chance you hear this daily! Learning through playing is not only the preferred method by children, its also the best way to get them to relate to what is being taught.

Play is a key element to a child's growth and development, and play stimulates the imagination, the emergence of ideas, and encourages creative expression. It is LEGO philosophy that "good play" enriches a child's life.

To learn more about the benefits of [Hands-On, Heads-In Learning](#), check out this feature article in the April/May issue of The Pitsco Network.

Letters and Sounds

This activity can be completed with either home-made or store-bought alphabet flashcards. To begin each student is given an ample amount of bricks. When ready the teacher shuffles the flashcards and randomly selects one from the deck.

The teacher presents the card to the class and asks the class to make the sound that particular letter makes. Remember: vowels and some special consonants are capable of making more than

one sound and students need to be reminded about these unique cases.

When the letter has been reviewed, the teacher instructs the students to build a model of an object which starts with that particular letter sound. When the students have finished building, the teacher should go around the room asking each student what they made, writing the name of each model on the board.

How long of a list were the students able to create? Can they think of more objects they could have built? Did the models built represent the various sounds that some letters can make? Did the students make any mistakes such as building a "cat" model when the letter "K" was drawn?

Remember that for younger students these kinds of mistakes are inevitable; if this does occur simply use it as a stepping stone into a discussion about why it is important to study letter sounds and words.

What's the Chance?

The teacher should divide the students into groups of two. Each group should be given a brown paper bag filled with one blue brick, two green bricks, three red bricks, and four yellow bricks. Once the students have received their bag, the teacher should point out the contents within.

Instruct Student A to close their eyes. Student B should then shake the bag. When finished, Student A will reach in the bag and grab one brick. Student A will then record the color of brick they picked on a sheet of paper. Student A will repeat this process six times. After the sixth draw, Student A should look at their records and predict which color of brick they believe they will pick the most.

When Student A has made his/her prediction, they should continue the random drawing process until they have recorded the color of twenty bricks. Student A and Student B should then switch roles, following the same process.

Did the students correctly predict the outcome? Did Student A and Student B have similar findings? Which color was recorded the most, the least? What is the cause of their results?

This activity focuses on developing four skills:

Recognizing possible outcomes of random events

Early ideas of chance

Tallying

Keeping a score

The Importance of Description

All students should be given the same set and amount of bricks. The teacher should build a model using the given brick set, but keep the finished product hidden from the students until the end of the activity.

When the students are ready the teacher will proceed by giving verbal directions on how to build the model he/she already constructed. However, there is a catch! The teacher should only use vague directions. For example, instruct the students to put the green brick on top of the yellow brick, but do not indicate the size of each of the bricks or the specifics on how they fit together.

When the teacher has finished giving directions, he/she should pull out their model and compare it to those built by the students. What happened? Are any of the models the same? Why or why not?

After this a discussion can take place on why being specific and descriptive when giving directions is important. Can the students think of a time when thorough directions could be very

beneficial? Are there any occupations which rely on being detail-oriented?

The Longest Caterpillar

All students should be given the same set and amount of bricks. After this, instruct them to build the longest possible caterpillar out of the given brick set. When the students have completed this task, decide upon a way of measuring how long each caterpillar is (draw on a piece of paper, trace around and cut out, count studs, etc.). The students should then compare their designs to those of their peers. Are there any ways in which the models could be improved to make the caterpillars even longer?

This activity focuses on developing four Key Learning Values:

Designing and making according to specific criteria

Problem solving and modifying designs

Length and informal comparisons

Using non-standard measures

A Must Have Building Resource

Thanks to the talent and time of ISOGAWA Yoshihito, LEGO users everywhere can access a new 200+ page building resource! **Tora no Maki** is the first of hopefully many books developed by Yoshihito illustrating how to build various mechanisms with LEGO Technic bricks. Over 300 building challenges are presented using more than 1700 images.

Topics covered in the down-loadable publication include: gears, bracing, pulleys, walking mechanisms, springs, differentials, and much more! The author is only asking for a \$10 donation if you find his work useful.

For more information or to download the publication and make a donation, [click here](#).

Riddles and Rhymes

Let the student's imaginations run free as they are allowed to build a model of any real-life object of their choice.

When each student has finished building, inform the class that everyone is now to create a riddle or a rhyme that gives clues as to what their completed model is.

Example:

It is big
It lives in the water
It rhymes with pail
What is it? (It is a whale!)

Each student then shares his or her model and riddle with the class or a group. The riddles should allow the other students to correctly guess what each of the models is. After someone has correctly identified the model, the student responsible for the design should explain how they conveyed the characteristics of the real-life object through their model.

Alien Discovery

Hide a pre-built LEGO alien model within the room. Divide the students into groups of four. Two

on each team will be the “builders”. One team member will be the “purchasing agent” and the final member will be the “architect or engineer”.

Purchasing agent: This team member will observe the hidden alien and report back to the team describing the elements needed to build the alien. The purchasing agent may not touch the elements, everything must remain verbal (it may be a good idea to have the agent clasp their hands behind their back or put their hands in their pockets). The agent may view the alien as many times needed to convey the specific elements; he/she may only observe...no touching.

Architect or engineer: This team member will observe the hidden alien but only after the elements have been selected and the purchasing agent has completed his/her job. The architect's/engineer's responsibility will be to describe verbally how the model is to be constructed so that it will look just like the hidden alien model. The architect/engineer may only communicate verbally...no hands!

Builder's: By listening carefully to the purchasing agent and the architect/engineer, the builders must select the specific elements needed and build the model per their architect's/engineer's instructions.

After a set time period, each team compares its alien construction to the hidden alien model, noting similarities and differences.

The Power of Imagination

Pre-build a simple LEGO model using only 5-7 elements. Divide the students into small groups of 3-4.

Give verbal directions to the class on how to construct a model that looks exactly like the pre-built model. Challenge each group to brainstorm what this model could be. Have them look at it in all different ways (upside-down, sideways, etc.). A note taker at each table can jot down all the possible ideas formulated by their group.

Ask each table to share their ideas. Which were the most original? Ask each group to elaborate on their original idea. What attributes, i.e. shape, colors, size, and features of the model helped the students to determine what it might be?

The Famous Sculpture

Hide a pre-built sculpture behind a board or under a towel. Divide into teams of 3-4. Give each team member a number from 1 to 4.

Tell the teams that when you say GO, team member no. 1 can rush to look at the sculpture for a little while. Then the team member has to run back to the team and explain how to build the sculpture. The team member cannot build while he/she is explaining how to build the sculpture.

After a short while, you call team member no. 2, who rushes to take a look at the sculpture and runs back to further explain the model. Continue until each team member has had a turn. When finished let the teams discuss and compare the completed sculptures with one another.

Ask the teams to guess which sculpture is closest to the design of 'the real one'. Proper argumentation should be used.

Tallest Tower

Divide students into pairs and give each pair a set of LEGO bricks. Ask the students to build the

tallest tower possible out of their bricks, in a two-minute time period. Compare the towers in the classroom and measure to determine the tallest. Variations:

Make students build the towers with one hand behind their backs.

Have students carry the towers from one desk to another to determine which is the most stable.

From the Drawing Board

Divide students into pairs and give each pair five different LEGO bricks. Ask Student A to make a two-dimensional footprint drawing of a structure that can be built with the available LEGO bricks. Student B can then build the structure using the drawing. The activity can be made more complex by adding bricks, or less complex by allowing Student A to color the different elements on the paper in the correct matching colors.

The Shy Dragon

Danny the Dragon has gone into hiding in a cave in the mountains. He is rarely seen, but is still very popular and the Mayor wants to make a memorial column with him on the top. Show a pre-built Danny the Dragon for 5 seconds to teams of 3-4. Then hide Danny back in his cave and ask each team to build a copy of him from memory. You may have to show Danny the Dragon one more time to all teams.

Back to Back

Divide students into pairs and give each an identical set of LEGO bricks. Ask the students to sit back to back, and tell Student A to build a structure out of their set of bricks. Without looking at the structure, the Student B must build an identical version with his or her own bricks, using only verbal instructions from Student A. Student A cannot look at Student B's progress, and Student B cannot ask questions.

All Activities

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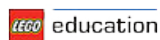
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Are you LEGO Smart?

Are you LEGO® Smart™? Are your students? Being LEGO Smart is more than building with LEGO® bricks. It's having the ability to work in teams, solve problems, and create solutions. It means understanding key science, technology, engineering, and math concepts – not just on

paper, but through demonstration. LEGO Smart students don't just know it, they DO it. The sets, software, and curriculum designed by LEGO Education harness the power of the LEGO brick and combine to create learning opportunities for students that will help develop the skills needed for a lifetime of creating, solving, and contributing to a global society. Be LEGO Smart – be the future.



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